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Spinning and Weaving as Ancient Egyptian Inherited Crafts

Dalia Soliman [1], Gamal El-Din Abdel Razeq [2], Youmna Zaki [3]

1 Touristic Guidance Department, Higher Institute for Tourism and Hotels, King Marriott Academy

2 Touristic Guidance Department, Faculty of Tourism and Hotels, Alexandria University

3 Touristic Guidance Department, Faculty of Tourism and Hotels, Alexandria University

Abstract

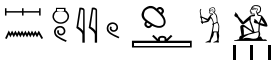
The Egyptian spinners and weavers have not changed over the years; they usually preferred the traditional, safe procedures of production and hand tools rather than adopting newer methods. Both ancient and modern Egyptian spinners and weavers are famous for using very simple tools to produce lots of high-quality products. Modern Egyptians have maintained several working tools such as wooden combs, hand spindles, and horizontal and vertical looms, in addition to following the same manufacturing techniques as their ancestors. Therefore, this study highlights the significance of the inherited similarities between ancient and modern spinners and weavers by analysing some spinning and weaving scenes. The research aims to clarify the inherited raw materials, manufacturing techniques, tools, workshops, and production centers. On the other hand, it explains the integral role of female spinners and weavers, particularly those who reside in rural areas, as they are the greatest preservers of spinning and weaving heritage.

Keywords: Spinning, Weaving, Crafts, Ancient Egypt.

1. Introduction

Both ancient and modern Egyptian spinners and weavers are famous for their high working skills. Their products express the Egyptian national identity, and the reliance on these products can positively contribute to tourism in Egypt. Textile making is a very ancient craft, with a history almost as old as mankind itself . (علماء الحملة الفرنسية، ٢٠٠٢).

Weavers had an important position in ancient Egyptian society and gained a lot of gifts during the Old Kingdom. During the Middle Kingdom, weaver titles appeared in texts. (نويجى، ٢٠١٨)

They were known as  *mrw* **weavers** (Wb. II, 1971). This title appeared during the Middle Kingdom. It was used by female weavers only. In addition to  *ḥndt* **female weaver**, (Wb. III, 1971)  *ḳnyw* **weaver**, (Wb. V 1971)  *ḥry mrw* **foreman of weavers**. (Faulkner, 1962). During the New Kingdom, they enjoyed a great reputation and worked inside great temples such as Luxor and Karnak (نورالدين، ٢٠٠٨).

1.1 The Inherited Raw Material (linen as a case study)

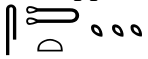
Ancient Egyptians cultivated thousands of acres of waving flax, the plant that yields linen. The most important use of domesticated flax was in the production of linen fibres (Giovanni,

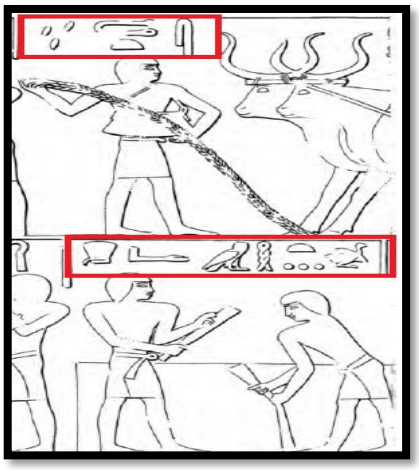
*Corresponding author: Dalia Soliman, dalia_soliman33@yahoo.com

1986). Linen was the most usable raw material for clothes for the following reasons:
Linen was thin, pure, very absorbent, and could be dyed with different colours (Henry, 1994).
Clothes made of linen are valued for their exceptional coolness and freshness in hot weather (Hassan, 2016).
It was essential for various rituals in the temple. It was used to clothe priests and servants and for their bedding (Vogelsang-Eastwood, 2001).
Linen was used in the funerals; large quantities of linen were required for the embalming process, the wrapping of the corpse, and the provision of the grave goods (Millard, 1976).
The oldest known example of Egyptian linen cloth known as Tarkhan cloth, which was found in Tarkhan near Fayum and dates back to the first dynasty, is now preserved in the Petrie Museum (Landi & Hall, 1979).
After being harvested, the flax plants were dried, combed, soaked in water, and then beaten to separate the fibres from the plants' woody core. The fibres were twisted together, spun onto the thread on sticks, and then woven on looms (Solodky, 2006).

2. The Inherited Manufacturing Techniques

2.1 Harvesting the flax

2.1.1 Ancient Egypt: Flax is an annual plant, rising on a single stalk, according to the quality of the soil, climate, and other circumstances, to a height of twenty to forty inches. The stem is smooth, simple, and erect; it is an elegant green color, and when at its full height, it is crowned with some small, bright blue flowers of a very delicate texture. After the flowers have faded, the seed heads appear, and the plants are ready to be harvested (Warden 2005).
Through trial and error, the ancient Egyptians learned that harvesting the crop at different stages of ripeness resulted in different kinds of fibre (Barber, 1991). When the flax stem was green, the soft fibre could be spun into the finest thread; when it was yellow, the stronger fibre could be woven into ropes and mats; and when it was brown, the tough fibre could be woven into ropes and mats (فهيم،2010).
The entire plant was first pulled up by the root rather than the stalks. Presumably, this was to obtain the longest fibres possible and preserve the fibres at their maximum length. Harvesting the flax can be seen in the tomb of Urarna (Fig. 1), which shows a man pulling the flax to the right side of the upper register; above his head is the word  *stt* "**pull up**" (Wb IV, 1971), and two men are refining the flax in the lower register (Davies, 1901).The hieroglyphic inscription in the second register reads  *ṯɜt ḥmˁ* "**Refining the flax**" (Wb V, 1971).



(Fig. 1) Pulling the flax instead of cutting it, and refining it
Urarna tomb (No. 25), West wall of the second room, Fifth Dynasty, Sheikh Said.
© (Davies 1901: Pl. XVI).

2.1.2 Modern Egypt: When the plants have flowered and the seeds begin to ripen, the crop is pulled up by the roots according to the same ancient Egyptian way (Cook, 2001).

2.2 Rippling process

2.2.1 Ancient Egypt: After drying, the rippling process was carried out with a coarse-comb-like wooden tool known as a flax-stripper. This would break up the hard outer fibres of the flax stalks and separate the seed capsules, from which oil is made. This process is shown in the tomb of Paheri (Tylor & Griffith, 1894) (Fig. 2).

(Fig. 2) Removing the seeds from the flax by a comb-like device
Paheri tomb (TT. 139), West wall of the main chamber, Eighteenth Dynasty, Sheikh Abd el Qurna.
© (Tylor and Griffith 1894: Pl.III).

2.2.2 Modern Egypt: After drying and cleaning the fibres from dirt and alien matter, The yarn must be combed with a wooden comb in one direction to disentangle the knots and facilitate spinning (Na'im, 2016).

2.3 Retting

2.3.1 Ancient Egypt: After the seed heads have been removed, it is necessary to ret the flax stems to remove the hard outer bark of the plant. To complete this process, flax is usually placed in slowly running water (Wilson,1979). According to Lutz, to separate the hard tissues from the fibres of flax, the ancient Egyptians dug a series of square water holes on a raised strip of ground. Bundles of flax were placed in these "ponds" to ferment. The bundles were left in the pits for about ten to fourteen days, during which time the fibres were exposed to the air and sun. The ensuing fermentation helped to remove the bark from the stems and separate the fibers. Then the flax is removed from the water and allowed to dry in the sun (Lutz,1923).

2.3.2 Modern Egypt: Modern Egyptians are still following the same method as the ancient Egyptians, which is called "ddam-retting". According to this method, the flax plants are tied up in sheaves or "beets" and immersed for about ten to fifteen days, according to the temperature of the water, in special dams or ponds dug in the ground to soften and disunite the fibers. (كامل، ١٩٩٢)

2.4 Beating

2.4.1 Ancient Egypt: The next stage involves beating the flax stems to separate the fibres from the wooden parts of the stem (Elsharnouby,2014). The beating was done with a wooden fan or bat (Fig. 3) before being scraped over a sharp, lipped tool to separate the woody parts from the long, flexible fibers. Then the fibers, freed of unwanted material, had to be combed straight to prepare the fibres to be spun into a thread (Hobbes & Brier 2008).

(Fig.3) Bat for beating flax, probably late Middle Kingdom
Found in Ellahun, Preserved in Petrie Museum, London (UC 63458)
Retrieved November 14, 2019 from:
https://www.ucl.ac.uk/museumsstatic/digitalegypt/tools/archive/uc7510.jpg

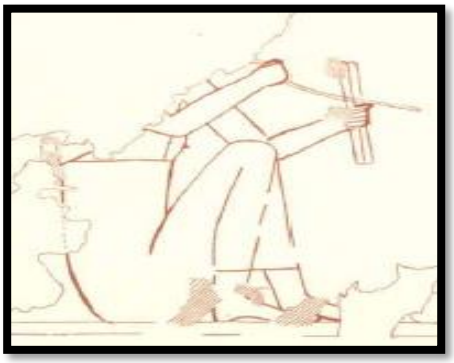
2.4.2 Modern Egypt: To separate the unwanted woody matter from the fiber, the flax is beated with a wooden bat (علماء الحملة الفرنسية ٢٠٠٢). This process is shown in (Fig. 4), where the worker simply beats the broken flax with a large wooden fan or bat, "el Manfada," to shake out all the loose pieces (Crowfoot, 1931). The woody matter is removed in the form of slivers, which are typically burned as fuel (Cook, 2001).

(Fig. 4) Beating the flax with a wooden mallet
Location: Nahya, Giza.
© (Crowfoot 1931: PL. 20).

2.5 Scutching/ Hackling

2.5.1 Ancient Egypt: To remove the twig from the fiber, the flax stems were passed

between two sticks held in the hand (Lucchesi, 2018). This technique can be seen in the Middle Kingdom tomb of Daga (Davis, 1913) (Fig. 5). Good fibres were then carefully picked out and laid together to form a loose thread. Using the spindle, this thread was moistened and twisted more tightly (Erman, 1894).



(Fig.5) A woman scutching the flax fibers by passing it through two sticks
Tomb of Daga (TT.103), East side of the sixth entrance, Eleventh Dynasty, Sheikh Abd el-Qurna.
© (Davis 1913: Pl. XXXVII).

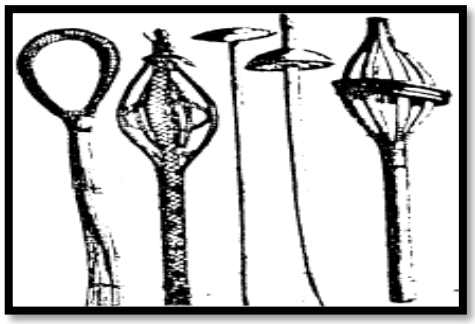
2.5.2 Modern Egypt: The hackling is a woman's work in modern Egypt (علماء الحملة الفرنسية ٢٠٠٢). In (Fig. 6) the flax is drawn through a comb called "El Misht," the metal teeth of which are set upright in a metal plate on a wooden block (Crowfoot, 1931). The technique of passing the flax stems between the metal teeth of "El-Misht" during the hackling process is inherited from the ancient Egyptian hackling technique, which was done by passing the flax stems between two sticks held in the hand.

(Fig. 6) Hackling the flax through a comb with metal teeth.
Location: Nahya, Giza.
© (Crowfoot 1931: PL. 21).

2.6 Spinning

2.6.1 Ancient Egypt: After drying, the fibres were given to a person, usually a woman, who shaped them into rough but orderly lengths. These lengths were produced by rolling the flax threads, usually between the palm and the left thigh, forming a loosely twisted strand. (Fig. 7) These were wound into loose balls and stored in basketry containers until they were ready to be spun (Young, 2008).
The most common form of spinning equipment to be used in ancient Egypt was the hand spindle. It was made of a stick (the shaft or spindle) with a weight (the whorl: a 2 to 4-inch disk). The whorl was attached nearer the top than the bottom of the stick. The whorl acted like a flywheel, keeping the momentum of the spine regulated for speed and uniformity of motion. The hand spindle is essential because it gives additional strength to the fibres (Vogelsang-Eastwood, 2001) (Fig.8).

(Fig.7) A woman rolling the flax threads between her palm and the left thigh
Tomb of Daga (TT.103), East side of the sixth entrance, Eleventh Dynasty, Sheikh Abd el-Qurna
© (Davis 1913: Pl. XXXVII).



(Fig.8) Hand spindle date back to the end of the Middle Kingdom
Found in Ellahun
© .(نوح ١٩٨٧)

2.6.2 Modern Egypt

During the spinning process, the transition from a loose fibre bundle to an actual yarn takes place. The bundle of parallel fibres is twisted, which gives the yarn its tenacity. Hand spinning is simple to do but requires skill, which has always been abundant in Egypt. It has been traditionally a domestic activity (McDowell, 2003).

Hand-spindle spinning is still occasionally used for flax thread for making nets and for other purposes. Manual spinning is mostly a woman's job. Such spinning can be seen at Kerdasa, near Giza, and Nahya, a village just north of Kerdasa (Crowfoot, 1931).

Types of spindles differ from one area to another, but the most common design involves two pieces of wood. One is the distaff "Nashshaba," which is a conical cylinder; the other piece is called "ud," which is a stick with a pointed tip. On its thicker end, a weight called a "falaka" or spindle whorl is hung (Na‘im, 2016).

2.6.3 Spinning the yarn

Work begins when the spinner, usually a woman, places the fibres at one end of the distaff, places the other end of the distaff under her right arm, and then starts to pull the fibre in one direction until she has enough length to hook it to the spinning hook "Sinnara." With her right hand, she then tilts the spindle upward, stinnara- side up, while holding the fiber with the tips of her fingers (جمعية الأصالة لرعاية الفنون التراثية و المعاصرة ٢٠٠٥) At this point, with the fingers of her right hand, she turns the bottom end of the UD. She then continues turning it in the same direction until the spinning session ends. As the ‘ud spins, the fibres are twisted, and a skilled spinner can keep the rhythm of the spinning steady enough to produce a yarn of consistent thickness. One of her works is done; the spinner winds the yarn around the ‘ud and under the whorl. Later, she takes the yarn off the spindle and wraps it repeatedly around her arm to make a skein. Once the skein is ready, the spinner's work is done (Na‘im, 2016).

2.7 Weaving

Ancient Egypt: In the weaving process, two yarn systems are used, the warp and weft threads, that are interlaced and lie at right angles to each other. The threads that run along the length of the fabrics (in the direction of production) are known as warp ends, while the threads that make up the weft threads are oriented perpendicular to the direction of production. The fabric's weave or design is how the warp and weft are interlaced. The pattern, or repeat, is the smallest unit of the weave, which when repeated will produce the design required in the fabric (Péreza & others, 2017). Excellent examples showing the weaving process are found in the tombs of Khnumhotep III (Fig.23), Thhutnefer (Fig.26), and Neferrenpet (Fig.27)

2.7.1 Loom types

Before weaving can begin, the warp threads must be arranged on the loom. There were two types of hand-operated Egyptian looms used in ancient Egypt, as follows (Vogelsang-Eastwood, 2001).

2.7.1.1 The horizontal loom (Fig. 9)

It was used from the Badarian period until the end of the Middle Kingdom, and sometimes later. It is a simple ground loom consists of a horizontal warp stretched in its length between two beams, at the top and bottom. The beams are generally kept in place by a pair of pegs driven into the ground (Clark, 1944). Working such a loom required kneeling (Hobbes & Brier, 2008). One of the oldest representations of this loom is on a pre-dynastic bowl (Badarian period) that was found in a woman's tomb (3802) at Badari in Lower Egypt and is now preserved at the Petrie Museum (UC9547) (Brunton & Caton-Thompson, 1928). One of the characteristic features of the cloth woven on the ancient Egyptian horizontal loom is a selvage edge, or weft-fringe, which is always on the left side of the cloth. Depictions of people wearing cloth with such a fringe are common in Middle Kingdom representations (Verdon 2018).

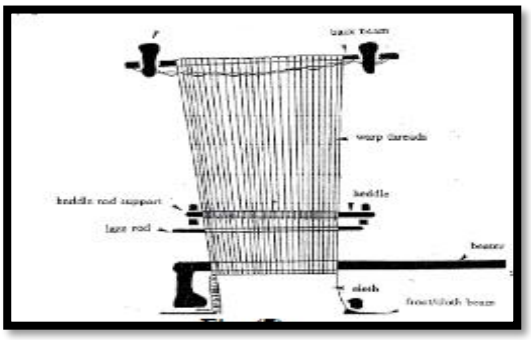
2.7.1.2 The vertical loom (Fig. 10).

It dated back to the New Kingdom. As the name suggests, instead of the warp being stretched horizontally, it is tensioned vertically. The warp ends are wrapped around two beams (the top and lower beams).

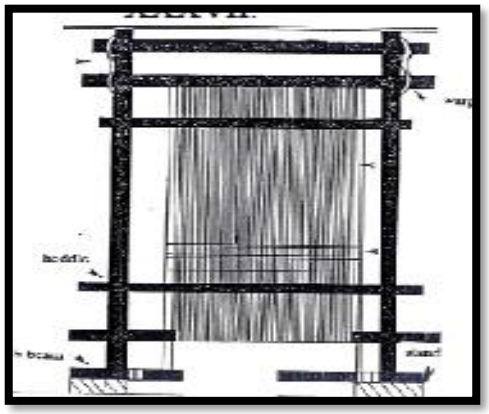
The loom is either vertically positioned or leaning against a solid object, such as a wall. These looms could be worked while sitting or standing (Hobbes & Brier 2008). In the New Kingdom reliefs, the vertical loom is operated by a single weaver, except for the larger ones, where two workers are needed because of the width of the loom (Giovanni, 1986).

Some preserved textiles from the New Kingdom with a selvage edge, or weft-fringe, indicate that ancient Egyptians used the horizontal loom with the vertical loom during the New Kingdom (Roehrig,1996). The ancient Egyptians used to work on the horizontal loom during the New Kingdom because it was much more suited to household weaving as it was smaller and more portable than the vertical loom, while the vertical loom was probably only used in very large households or commercial weaving (Roth, 1951).

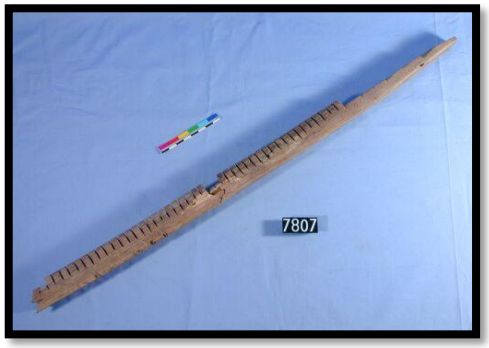
Whatever type of loom was used, weaving followed the same principles. When the thread was ready for weaving, the warp threads were attached parallel to one another between the two main beams of the loom. In the simplest weaving, the weft thread is passed over and under alternate warp threads. On its return, the path of the weft thread was reversed, so that it passed on the opposite side of each warp thread. Weavers started at the bottom of the loom and worked their way up to the top. A stick or comb (known today as a heddle rod) was often used to beat down and press the weft threads together, creating a space between each set. (Fig. 11) For the next pass, which had to reverse the over and under of the previous row, a second rod attached to the remaining warp threads raised them above the others. A wide paddle (a weaving sword) could now be shoved between the two warp sets to force a space. (Fig. 12) Then the weft rod was thrown back across, creating the second row of the cloth. In this manner, the weft passed over and under different warp threads every two rows, forming a tightly woven fabric (Hobbes & Brier, 2008).



(Fig. 9) Horizontal loom
© (Elsharnouby 2014: Fig. 7).



(Fig. 10) Vertical loom
© (Elsharnouby 2014: Fig.8).



(Fig.11) Heddle rod
Found in Ellahun, Preserved in Petrie Museum, London (UC 7807)
Retrieved November 14, 2019 from: http://www.ucl.ac.uk/museumsstatic/digitalegypt/tools/archive/uc7510.jpg

(Fig.12) A weaving sword, probably New Kingdom
Found in Gurob, Preserved in Petrie Museum, London (UC 7807)
Retrieved November 14, 2019 from: http://www.ucl.ac.uk/museumsstatic/digitalegypt/tools/archive/uc7510.jpg

Modern Egypt: To weave a fabric, the weaver operates the loom in a way that interlaces the vertical yarn, called "Sada", or warp, with the horizontal yarn, called "Lahma", or woof (also called the weft) (على، ٢٠٠٥). The weaver receives the yarn in the shape of skeins or balls, and these must be attached to the loom in a particular fashion before the process of weaving begins. (Na'im, 2016).

2.7.1.3 Loom types

The modern loom used in the textile industry today essentially performs the same operations as the simple hand-operated loom. Looms are an exceptionally convenient at-home business, it needs no source of energy, and the production process can be divided among family members. If the circumstances are right, one loom can support an entire family. The towns of Akhmim in the governorate of Sohag, Abu Sha'ra in the governorate of Minufiya, and Harraniya in the governorate of Giza all made weaving their main activity and way of life (Wadji, 2009).
Types of looms vary in size and shape according to the quality of the product and the space in which the loom is placed. Loom sizes vary according to the required product (Na'im, 2016).The modern horizontal loom appears to be a direct descendent of the Middle Kingdom Egyptian prototype (Broudy, 1993) such as that in the tomb of Khnumhotep III. It is used to make kilims. The vertical loom which was appeared in the tombs of the New Kingdom of Thutnefer and Neferrenpet at Thebes is still used by modern weavers to make carpets and rugs (أبو هاشم، ٢٠٠٢).

(Fig. 13) Modern horizontal loom
© (نجيب، ٢٠١٠)

(Fig. 14) Modern vertical loom
Retrieved November 17, 2019: www.wissawassef.com

2.7.1.4 Anatomy of a Loom

A manual loom contains wooden beams placed in both vertical and horizontal positions. The function of the loom is to lift one set of the vertical warp yarn to allow for the threading of one horizontal yarn through. The lifting is done with pedals, called dawwasat (sing. dawwasa), or treadles, attached to the loom's mechanism. The process is then repeated with another set of warp yarn lifted, with the woof yarn heading in the opposite direction. This two-step operation is repeated as many times as needed to create the length of material the weaver desires (Na 'im, 2016).
The ancient Egyptian weavers used to sit on the ground while working on a horizontal loom (Fig. 15) because the warp threads were wound

around two beams fixed by pegs in the ground. The vertical loom was either placed vertically or leaning against a wall, so weavers were usually shown sitting on benches at the base of the loom, such as in the tombs of Thhutnefer (Fig.26) and Neferrenpet (Fig.27) (Gillian, 2000). In modern Egypt, weavers operating a horizontal loom have to deal with two treadles by their feet, so as to reduce the pressure of motion on their backs, they have to sit on a bench in front of the loom which is connected to the loom's main body. Modern weavers operating a vertical loom have inherited the same working posture as their predecessors and still sit on benches at the base of the loom (Fig. 14) (Na'im, 2016).

2.7.1.5 The main components of the loom

Zarakun: The bench on which the weaver sits opposite the loom. It is a flexible plank of wood resting on both sides of a wooden support that may be connected to the loom's main body (Fig. 15) (Na'im, 2016).

Matwa: The cloth roll, which is a horizontal beam around which the finished fabric is wound as it comes out of the loom. (Fig. 16)

Huqq, or knob: A wooden handle mounted on the axis of the matwa. The weaver turns it in one direction as needed to catch the finished fabric and keep it from rolling onto the floor.

Rawwah, or sender: a wooden handle mounted on a spool that is connected by a rope to the top of the loom. It controls the mizan al-rawwah, or sending balance, which allows the makuk, or shuttle, to travel back and forth, threading the woof into the warp (Fig. 17) (حنا، ٢٠١١).

Duff, or Sidebar: A rectangular wooden beam positioned horizontally towards the weaver, who presses it to keep the warp yarn straight and tight (Fig. 18). (جمعية الأصالة لرعاية الفنون التراثية و المعاصرة ٢٠٠٥).

Misht, or Reed: A comb-like structure mounted just below the duft. The misht, originally made of reed and used to standardize the distance between the warp threads (Fig. 19) (أبو هاشم، ٢٠٠٢).

Daraqa, or Heddle Frame: A wooden frame holding a series of eye-like openings called heddles ('uyun al-nir). These heddles control the weaving process, as it is through them that the warp yarn passes, allowing the motion of the daraqa to raise or lower the warp at the right moment for the woof to run through it. (Fig. 20)

Dwwasat (sing dawwasa), or Treadles: Foot-operated wooden pedals that control the motion of the heddle frame. When the weaver presses a dawwasa, the corresponding heddle is lifted, allowing the woof to pass underneath (Na'im, 2016). (Fig. 19)

Sanduq al-tala, or upper box: a wooden beam connected to spools bearing weights. Because the warp tends to be long, there is a need to regulate its tension so it doesn't slacken. This is done through the wooden beam called sanduq al-tala and the weights attached to it, which are usually sandbags or stones. (Fig. 21)

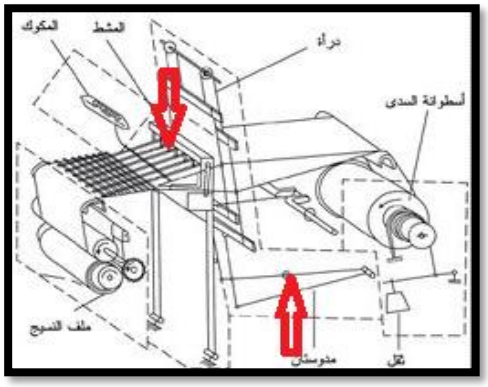
Makuk, or shuttle: an elongated piece of wood with a pointed tip hollowed inside to house a spool bearing the woof. The purpose of the shuttle is to carry the weft thread from side to side across the loom through the opening or shed. Both hands are used to work the shuttle: one to insert it through the open shed, the other to pull it out at the other side with the weft thread already laid in place. (Fig. 22) (كامل، ١٩٩٢).

(Fig. 15) Zarakun
After: (حنا ٢٠١١: شكل. ١)

(Fig. 16) Matwa
After: (حنا ٢٠١١: شكل. ٢)

(Fig. 17) Rawwah
After: (حنا ٢٠١١: شكل. ٣)

(Fig. 18) Duff
After: (حنا ٢٠١١: شكل. ٤)



(Fig.19) Misht and dawwasat
Retrieved November 20, 2019 from: https://www.marefa.org/%D9%86%D8%B3%D8%AC

(Fig. 20) Daraqa
After: (حنا ٢٠١١: شكل. ٧)

(Fig.21) Sanduq al-tala
After: (حنا ٢٠١١: شكل. ١٠)

(Fig.22) Makuk
Retrieved November 20, 2019 from:https://www.wikipedia.org/wiki/%D9%85%D9%83%D9%88%D9%83_%D9%86%D8%B3%D9%8A%D8%AC

2.7.1.6 Operating a Manual Loom - production technique

A weaver operating a loom with two treadles, or dawwastayn, and two heddle frames, daraqatayn, will set the loom with the warp passing from the top all the way to the matwa, or cloth roll, below. The warp will have to go through the heddle eyes of the daraqatayn. At the very top of the loom, the warp will be draped over the sanduq al-tala, or upper box, and its tips will be weighed down by the stones of sandbags known as bayt al-tuql, or the house of weight. The daraqa will lift the first set of the wrap, leaving beneath it a space wide enough for the shuttle to run through.

The weaver will then use his or her right hand to turn the handle of the rawwah, or sender. This motion will send the shuttle flying horizontally across the loom, passing between the two sets of warp yarn from right to left, adding one line of weft, or one more thread, to the length of the fabric. Then, with the left foot pressing the left

treadle, the weaver will repeat the process, opening another shed in the warp yarn for the shuttle to run in the opposite direction, adding another line of weft to the material, and so on.
After making a certain amount of progress, the weaver will use his or her left hand to press the thread into place with the duffel, ensuring a taut weave. The weaver will also use the misht situated under the duff to ensure that the distance between the warp threads remains steady (Na'im, 2016).

3. Workshops and Production Centers

3.1 Ancient Egypt: Men, women, and children were represented working together at the same workshop. During the Middle Kingdom, linen workshops were supervised by women. From the New Kingdom onward male overseers were represented supervising the work of female weavers such as in the tomb of Khnumhotep, and Baket III at Beni Hasan (الصياد، ٢٠٠٧). Female weavers were represented more than male weavers in workshops either in the Old, Middle, or New Kingdom (Baines, 1989).
From several sources, it is known that large estates, temples, and palaces in ancient Egypt usually contained various attached workshops, including spinning and weaving ateliers, to provide the household with necessary items, especially the royal line (نوح، ١٩٨٧) .These workshops were supervised by the royal harem. The women's specialist knowledge of textile production resulted in part-time specialization, but only a state-like organization of a given society enabled the existence of full-time specialists (Rahmstorf, 2015). The production of textile took place also in both small and large housing unit (حامد، ٢٠٠٢).
Numerous hand spindles have been found at the Middle Kingdom site of Illahun. Similar finds of spindles were excavated at the New Kingdom site of the workmen's village at Tell el-Amarna (Granger-Taylor, 1998). Several letters were written during the Middle Kingdom that mention the production of cloth at home by using looms (Robins, 1993).

3.2 Modern Egypt: Looking at the expansion of weaving in Egypt, weavers are becoming active just about everywhere, in the cities as well as the villages (Ammoun, 1998).
The result is that weaving continues all over Egypt in different production centers, such as:
Akhmim: where the weavers of Akhmim restricted their work to making broad wraps (melayas) or fringed cotton shawls (Na'im, 2016).
Naqada: which is one of the oldest specialties of farka (Saad, 2007), Farka is exported mainly to Sudan, which is why it is sometimes called Sudanese farka. The women of Sudan wear it on weddings (Na'im, 2016).
Garagos: where weavers make smaller pieces of artificial silk called firika for themselves.
Asyut: In this city, the weavers specialized in carpets and rugs.
Geheina: where weavers have adopted the same patterns for the walls of the houses as they have for their carpets (Na'im, 2016).
Oases: women weave goats' wool into small, brightly coloured Bedouin rugs.
Western Desert: at Borg al Arab and in the area around Marsa Matruh, women produce woven rugs.
Harraniya: is a village that owes its fame to one man, the architect Ramses Wissa Wassef. Today, people come to visit his white-domed atelier, which houses weavers of all ages (Ammoun, 1998).
Kerdasa: Their fabrics regularly take the road to Libya and sometimes to Sudan (Ammoun, 1998).

4. The Role of Women in Textile Production

4.1 Ancient Egypt: It is clear from both texts and depictions that the vast majority of women were the backbone of textile production. The main reason seems to be that the easily interruptible work of spinning and weaving could be done at home (Barber, 1991).
Based on artistic evidence, it appears that men were most frequently involved in the cultivation and harvesting of flax and the preparation of the fibers for spinning (Roehrig, 1996).
Women were usually represented working at ground looms, while men were more often shown working at vertical looms. It may have been because the vertical loom had prestige, or perhaps because it was heavier and therefore

required more strength to work. However, this division of work wasn't stable in ancient Egypt, since women were shown sometimes working on small vertical looms, such as those in the tomb of Neferrenpet at Thebes (Coghlan, 1964). Female spinners and weavers held important titles and worked in the royal palaces; this reflects their great social status, especially among other males (Strouhal, 1996). During the New Kingdom, the occupation was no longer limited to women, and the number of men who held important titles surpassed the number of women.

Most scenes of female and male spinners depicted them using two spindles simultaneously to produce two separate yarns, as would be the case on a large estate with many people to dress, at a temple with its groups of priests, or, especially, at the royal court (Hobbes & Brier, 2008). This is an indication of their great skills (Baines, 1989).

4.2 Modern Egypt: Rural women became involved from the start with the expansion of textile industries in Egypt. Women performed the fundamental functions of the production processes within their family units.

The structural changes in urban market demand had a gradual but steady impact on rural women's role in textiles over time. It ranged from an expansion of weaving centres in the countryside to a rigid specialization of functions among workers. Normally, functions were stratified by gender and age. Within this new system of division of labor, women cleaned, carded, combed, and spun yarn. As weavers, men held higher status positions (Hassan, 1997). Despite the difficulties it faces, weaving is still a flourishing activity in Egypt. Hand weavers will have to withstand competition from mechanical weaving by selling at a higher price because they can offer the dual advantage of better quality and more varied products (Moisseron, Fazzani, and Guesmi 2018).

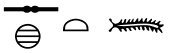
5. The Inherited Craft from Some Selected Ancient Egyptian Tomb Scenes

5.1 Old Kingdom

There is no representation of spinners and weavers in the Old Kingdom; they were not depicted in tombs till the beginning of the Middle Kingdom, although they were doing this work from the time of the Old Kingdom. Only flax harvest cultivation scenes were represented during the Old Kingdom (Giovanni, 1986).

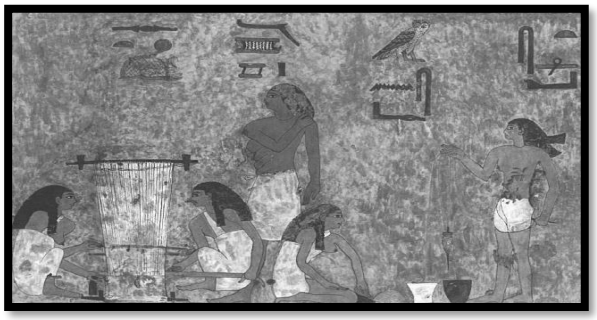
5.2 Middle Kingdom

5.2.1 Khnumhotep III tomb (Fig.23)

One well-preserved scene of weaving in the Middle Kingdom is found in the tomb of Khnumhotep III. Five women are shown occupied in different stages of linen manufacture. The second kneeling woman to the right is roving flax and has wound the loosely twisted fibres into a ball in front of her. The ball would have been placed in the spinning bowls to the right, which probably kept the fibres damp and provided tension during spinning.Above her is inscribed  *msn* **"clearing the thread**"(Wb. II, 1971) Next to her is a standing figure of a female spinner preparing rove. Above her is inscribed  *st* **"spinning"** (Faulkner, 1962). Her hair is arranged in two flaps. She seems to be working on two spindles at once. At the centre of the scene is a woman identified as the overseer, who supervises two weavers who work at the horizontal loam. Above them is inscribe  *sḫt* **"weaving"** (Wb. IV, 1971).

The warp threads are wound around two beams held apart by four pegs in the ground (El Kilany, 2007). The extra wrap is wound around the upper beam, and the finished cloth is rolled up around the lower beam. Along the left-hand side of the newly woven cloth, a short-looped fringe has been woven into the selvage (Kamrin, 1999).

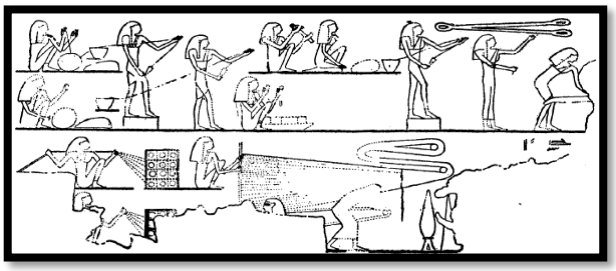
In this scene, it is interesting to note that women of all ages are depicted. The overseer, with her drooping breasts and rolls of fat, is clearly meant to be old (Broudy, 1993). The rover and the weaver seated at the left each have large, slightly drooping breasts and probably are meant to be mature, though perhaps not old. The other two figures, with their rather small breasts, seem to represent either girls or young women (Roehrig, 1996).



(Fig. 23) Female supervisor in a female spinning and weaving workshop
Tomb of Khnumhotep III (No. 3), West wall of the main chamber, Twelfth dynasty, Beni Hasan © (Newberry 1893: Pl. XXIX).

5.2.2 Djhutyhotep tomb (Fig.24)

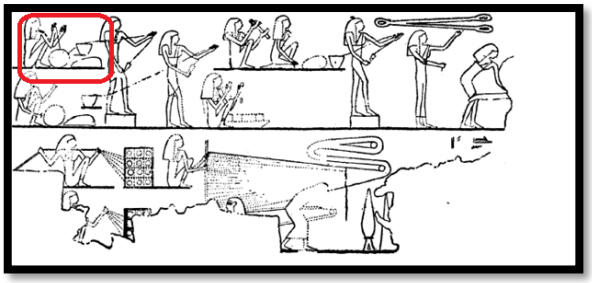
In the two registers, some spinners and weavers are occupied with carding, spinning, and weaving. The topmost of these two rows involves the production of the yarn, while the lower one concerns the actual weaving, using a horizontal loom.
Here the spinners are shown standing, each spinning with one spindle and drawing the rove from a bowl on the ground behind her. Two of the spinners stand on a raised platform to obtain a longer spin. Behind each spinner sits another woman preparing the rove for her; each has a block in front of her, and two have large balls already wound (Crowfoot, 1931).
The upper register: From left, a woman depicted sits on the ground, with a bowl and lump of fibre before her. She may take a handful of the fibre and lay it in the bowl in front of her; when it was well moistened, she drew it out in her hands and softened it by chewing. After this was finished, and possibly a loosely compacted twin was formed, it was placed in the second bowl to keep damp. The woman is stretching out her two hands in front of her face, with a thread between them held in her mouth. The thread seems to end in the first bowl, but there is certainly also a line from one bowl to the next. From the second bowl, the line passes to the left hand of the standing figure, who spins it into a firm thread with her spindle, which twists on the right thigh. By raising the foot, the right leg bent naturally. Following that, a group of spinners used the same spinning technique. At the top, there are some looped ropes, pegged out; it may be too dry.
Lower register: Two seated women are gathering threads into a band from a tray of twelve divisions, each containing a ball of material. Next, a seated woman is working on a horizontal loom. She is followed by a woman who, bending over, has a rope passed around her knee (Newberry, 1889).



(Fig. 24) Female spinners and weavers
Tomb of Djhutyhotep (No. 2), Right wall of the inner chamber, Twelfth Dynasty, El Bersha.
© (Newberry 1893: Pl. XXVI).

The researcher noticed an interesting inherited technique from the previous scene, which is the method of spinning threads by mouth. This method is still practised by modern female spinners in Nahya.

The female spinners of Nahya do spin through their mouths; they let the growing thread run between their lips to keep the fibres even and moist. The flax is held in the left hand, close to the mouth (Fig. 25), and the spindle is twirled, whorl downwards, by the thumb and first and second fingers of the right hand (Crowfoot, 1931).



Female spinner from the tomb of Djhutyhotep is spinning threads by her mouth.

(Fig. 25) A woman spinning the flax thread by her mouth.
Location: Nahya, Giza.
© (Crowfoot 1931: PL. 22)

5.3 New Kingdom

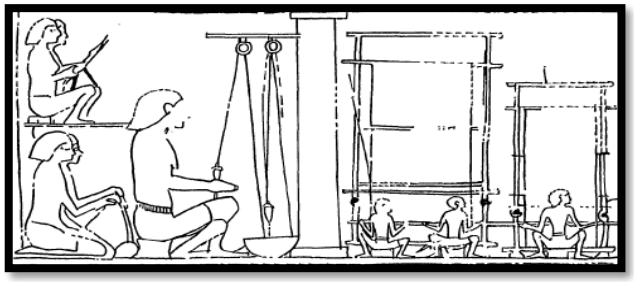
Representations of spinners and weavers during the New Kingdom are so limited.

5.3.1 Thhutnefer tomb (Fig.26)

In the tomb of Thhutnefer, there is a scene of a spinning and weaving workshop. In the top section on the left, two women are involved in the hackling process. The two women are sitting on the stool and are represented next to each other. They are drawing the flax fibres through the combs.

On the register below, two women are seated next to each other and are shown spinning the yarn with their hands and winding it into a ball. The posture of the two spinners is exactly the same. When they are finished preparing the rough yarn, they appear to be giving it to the spinner. The next figure places the balls of yarn in the bowl in front of her and re-spins the rove into a finer and more even yarn. The woman is holding the grasped spindle with both hands and is spinning the rove, which comes from a large bowl. It then passes through a ring attached to a rod. Attached to the same rod is another ring, from which hangs a gyrating spindle. She sits on a cushion or stool and has a short haircut. She is represented with a ragging breast, which may indicate her old age (Gillian, 2000).

In the other section of the room, separated by the column, two vertical looms are represented. The larger loom is worked by two men, the smaller by one man only. The weavers sit on benches with their backs to the spectators. They are holding a heavy-looking rod (Davis, 1913).



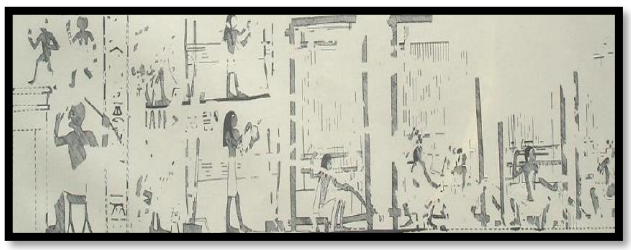
(Fig. 26) Female spinner (left) working with males (right) at the same workshop
Tomb of Thutnefer (TT.104), Tomb Hall, Eighteenth Dynasty, El-Qurna.
© (Gillian 2000: Fig. 11.4b)

5.3.2 Neferrenpet tomb (Fig.27)

As was normal in the New Kingdom, both males and females worked together in the same workshop. This scene is not in a good state of preservation, which makes it difficult to distinguish females from male figures, but some figures can still be recognized. There are four females, a child, and a man depicted carrying the white material made of linen fibers.

Two women are stretching the wrap between two uprights shaped like a tuning fork and planted in a block. The thread is then cleaned or doubled by two figures. Then, there are four vertical looms depicted. (Davies, 1948).

Threads on the vertical loom were stretched vertically rather than horizontally as on the ground loom. The wrap ends were wrapped around two beams. Weavers stood or sat at the base of the loom, working upwards, and the loom was either vertically or leaning against a firm object, such as a wall. The warp was released during the weaving process by turning or lowering the warp beam (Gillian, 2000).



(Fig. 27) Females and males working together in a weaving workshop.
Tomb of Neferrenpet (TT.133), East wall, south side, Nineteenth Dynasty, El- Qurna.
© Davies, N. (1948), Seven Private Tombs at Kurnah, London, Pl. XXXV.

6. Conclusion

- Egyptian society is very traditional; the Egyptians seldom completely abandon an older, proven method in favour of a newer one. Modern Egyptian spinners and weavers are still using tools similar to those of the ancient Egyptians, such as wooden combs, hand spindles, and horizontal and vertical looms, in addition to following the same manufacturing techniques as their ancestors.
- Both ancient and modern Egyptian spinners and weavers used to use very simple tools and were able to produce lots of high-quality products.
- Women have a very important role in spinning and weaving, either in ancient or modern Egypt, because these crafts could be done at home where women could continue to raise children at the same time.
- Egyptian spinners and weavers who live in rural areas are the most preservers of their heritage, either in their working techniques or in their way of life, because they live outside towns and cities and are far from high modernity. They are self-absorbed primitives, very proud of their inherited crafts.
- The textile industry, and handcrafted items in general, play a significant economic role in society. Because of their Egyptian identity, tourists are eager to purchase hand-made products, particularly in tourist areas. They want to purchase goods and souvenirs that are considered "typical" cultural products of the region they are visiting.

References

Ammoun, D. (1998), Crafts of Egypt, Cairo.

Baines, P. (1989), Linen: Hand Spinning and Weaving, London.

Barber, E. (1991), Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages with Special Reference to the Aegean, Princeton.

Broudy, E. (1993), The Book of Looms: A History of the Handloom from Ancient Times to the Present, Hanover.

Brunton, G.& Caton-Thompson, G. (1928) The Badarian Civilization and Pre-dynastic Remains Near Badari, London.

Clark, C. (1944), 'Egyptian Weaving in 2000 B.C ', The Metropolitan Museum of Art Bulletin.3 (1).

Coghlan, H. (1964), Studies in Ancient Technology, Vol. IX, Leiden.

Cook, G. (2001), Handbook of Textile Fibers, Abingto.

Crowfoot, G. (1931), Methods of Hand Spinning in Egypt and the Sudan, Halifax.

Davies, N., (1901), The Rock Tombs of Sheikh Saïd, London.

Davis, N. (1913), Five Theban Tombs, London.

Davies, N. (1948), Seven Private Tombs at Kurnah, London.

El Kilany, E. (2007), Scenes Depicting Female Occupations in Ancient Egypt at the Private Tombs from the Old Kingdom to the end of the New Kingdom, Unpublished PhD thesis, Faculty of Tourism & Hotels, Minia University.

Elsharnouby, R. (2014), 'Linen in Ancient Egypt', Journal of the General Union of Arab Archaeologists (15).

Erman, A. (1894), Life in Ancient Egypt, London.

Erman, A. & Grapow, H. (1971),Wörterbuch der Ägyptischen Sprache, Vols. I- V, Leipzig: J.C. Hinrichs.

Faulkner, R. (1962), A concise Dictionary of Middle Egyptian, Oxford.

Gillian, V. (2000), 'Textile', In: the Ancient Egyptian Materials and Technology, (Eds.) Nicholson & Shaw, Cambridge.

Giovanni, T. (1986), the Development of the Egyptian Textile Industry, Unpublished PhD Thesis, University of Utah.

Granger-Taylor, H. (1998), 'Evidence for linen yarn Preparation in Ancient Egypt—the Hanks and Fiber Strips and the Balls of Prepared Rove from Lahun in the Petrie Museum of Egyptian Archaeology, University College London (UC 7421, 7509 and 7510)', In: Lahun studies, (Ed.) Quirke, S., Reigate.

Hassan, G. (2016), 'Mechanical Engineering in Ancient Egypt', Part XIX: Textile Industry, International Journal of Advanced Research in Management, Architecture, Technology and Engineering 2 (12).

Hassan, N. (1997), In search of livelihood: Females' Informal Factory Work in Textile and Garment Manufacturing in Rural Egypt, Unpublished PhD Thesis, University of Wisconsin-Madison.

Henry, A. (1994), Current Techniques of Ancient Textile Analysis: A Critical Review, MA Thesis, Durham University.

Hobbes, H. and Brier, B., (2008), Daily Life of Ancient Egyptians, 2nd (Ed), London.

Kamrin, J. (1999), The Cosmos of KhnumhotepIII at Beni Hasan, London.

Landi, SH. and Hall, R. (1979), 'The Discovery and Conservation of an Ancient Egyptian Linen Tunic', Studies in Conservation (24).

Lucchesi, CH. (2018), The Unwound Yarn Birth and Development of Textile Tools between Levant and Egypt, Venezia.

Lutz, H. (1923), Textiles and Costumes among the Peoples of the Ancient Near East, New York.

Mcdowell, A. (2003), 'Kahun: The Textile Evidence', In: the Pyramid Builders of Ancient Egypt: A Modern Investigation of Pharaoh's Workforce, (Ed.) Rosalie David, New York.

Millard, A. (1976), The Position of Women in the Family

and in Society in Ancient Egypt: with Special Reference to the Middle Kingdom, PhD Thesis, University of London.

Moisseron, J. and Fazzani, S. and Guesmi, KH. (2018), 'Assessing EU–Mediterranean Policies in the Field of Industry from a Bottom-up Perspective: The Case of Egypt', Medrest Working Papers (26).

Na'im, H. (2016), 'Textiles, the Reward of Patience', In: the Traditional Crafts of Egypt, (Ed.) Menah el-Batraoui, Cairo.

Newberry, P. (1893), Beni Hasan I, London.

Péreza, J. and others, (2017), 'Manufacturing Processes in the Textile Industry: Expert Systems for Fabrics Production', ADCAIJ. 6 (4).

Rahmstorf, L. (2015), 'An Introduction to the Investigation of Archaeological Textile Tools', In: Tools, Textile and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age, (Ed.) E. Andersson Strand, M. Nosch, Oxford.

Robins, G. (1993), Women in Ancient Egypt, London.

Roehrig, C. (1996), 'Women's Work: Some Occupations of Non-royal Women as Depicted in Ancient Egyptian Art'. In: Mistress of the House Mistress of the Heaven, Women in Ancient Egypt, (Eds.) Anne K. Capel & Glenn E. Markoe, New York.

Roth, H. (1951), Ancient Egyptian and Greek Looms, Halifax.

Saad, R. (2007), Transformations of Marginality: Crafts and Craftspeople in Upper Egypt, Cairo.

Solodky, M. (2006), The Technology of Ancient Egypt, New York.

Strouhal, E. (1996), Life of Ancient Egyptians, Cairo.

Tylor, J. and Griffith, J. (1894), The Tomb of Paheri at El-Kab, London.

Verdon, T. Scientific Analysis and Technical Study of Three Ancient Egyptian Royal Textiles from The Tomb of Hatnofer and Ramose, Western Thebes, New Kingdom, Dynasty 18, 1550-1295 B.C., (Unpublished MA Thesis, Fashion Institute of Technology.

Vogelsang-Eastwood, G. (2001), 'Weaving, Looms, and Textiles', In: The Oxford Encyclopedia of Ancient Egypt, (Ed.) D.B. Redford, Vol. III, New York.

Wadji, P. (2009), 'Textile: Fibre to Fabric Processing', IE (I) Journal-TX (90), 30 - 36.

Warden, A. (2005), the Linen Trade, Ancient and Modern, Abington.

Wilson, A. (1979), A History of Textiles, Boulder-Colorado.

Young, G. (2008), 'Textiles in Egypt', In: Encyclopedia of the History of Science, Technology, and Medicine in Non- Western Cultures, (Ed.) Helaine Selin, Berlin.

احمد نويجى، (٢٠١٨)، العمال والحرفيون فى الدولة الحديثة، رسالة ماجستير غير منشورة، المعهد العالى لحضارات الشرق الادنى القديم، جامعة الزقازيق.

أمينة على، (٢٠٠٥)، أثر السياحة فى تطور بعض الحرف والصناعات التقليدية دراسة انثربولوجية، كفر الشيخ.

جمعية الأصالة لرعاية الفنون التراثية والمعاصرة، (٢٠٠٥)، موسوعة الحرف التقليدية بمدينة القاهرة التاريخية، ج٢، لقاهرة.

حسنية حامد، (٢٠٠٢)، صناعة المنتجات الحيوانية فى مصر الفرعونية، رسالة دكتوراه غير منشورة، كلية الآداب، جامعة طنطا.

عبد الحليم نورالدين، (٢٠٠٨)، الملابس والأزياء فى مصر القديمة، الموسم الثقافي الأثري الثالث، مكتبة الإسكندرية.

عبد الرافع كامل (١٩٩٢)، مدخل إلى تكنولوجيا النسيج والتابسترى، ط٢، القاهرة.

عبد الستار أبوهاشم، (٢٠٠٢) فن صناعة السجاد والكليم اليدوي، القاهرة.

عزالدين نجيب، (٢٠١٠)، الأنامل الذهبية، ط٢، القاهرة.

علماء الحملة الفرنسية، (٢٠٠٢)، موسوعة وصف مصر، " الزراعة- الصناعات والحرف- التجارة"، ج.٤، القاهرة

عماد الصياد، (٢٠٠٧)، تصوير فئات الطبقة الدنيا فى المجتمع المصري القديم من خلال النصوص الأدبية، رسالة ماجستير غير منشورة، كلية الآداب، جامعة الإسكندرية.

نعيم حنا (٢٠١١)، النسيج اليدوي بأخميم، مجلة الفنون الشعبية، عدد ٨٩، القاهرة.

نيفين فهيم، (٢٠١٠)، تقنيات وطرق علاج المنسوجات المزخرفة ذات اللحمات غير الممتدة تطبيقا على نماذج من منسوجات المتحف المصري، رسالة ماجستير غير منشورة، كلية الآثار، جامعة القاهرة.

هبة نوح، (١٩٨٧)، المنسوجات فى مصر القديمة: دراسة لغوية من خلال النصوص الهيراطيقية والهيروغليفية، رسالة ماجستير غير منشورة، كلية الآثار، جامعة القاهرة.