

# Mechanical Engineering in Ancient Egypt, Part 56: Basketry Industry

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**Abstract**— The production of basketry in ancient Egypt is investigated. Uses and designs of basketry are presented in different aspects of the daily life of the ancient Egyptian society. Samples of ancient Egyptian basketry are presented according the historical period are presented and investigated starting from Neolithic to Late Periods.

**Index Terms**— Mechanical engineering history, ancient Egypt, basketry industry.

## I. INTRODUCTION

The ancient Egyptian needed basketry to help him in too many activities of his daily life such as storage, transportation, presentation, offering, etc. He left behind him samples of basketry that could survive for more than 7000 years without deterioration.

Florian, Kronkright and Norton (1990) provided extensive information about plant anatomy, identification, technology, deterioration of artefacts made from plant materials and conservation. The presented a useful appendix about adhesives characteristics and dyeing with fiber reaction dyes [1]. Silvester (2000) in his Ph. D. Thesis presented how the ancient Egyptians used the basket symbol in their hieroglyphs [2]. Nicholson and Shaw (Editors, 2000) in their book about ancient Egyptian materials and technology presented a complete section about basketry in ancient Egypt and provided examples of the ancient Egyptian basketry from Fayum, Tarkhan and Beni-Hasan [3]. Janick (2002) in his paper about ancient Egyptian agriculture presented scenes for ancient Egyptians using baskets in their daily life from tombs in Beni-Hasan (1900 BC) [4].

Takane (Editor, 2010) presented a study for the fibre plants of Africa and their usage. Their study covered the production and use of basketry in Ghana [5]. Hadidi and Hamdi (2010) studied the production of coiled basket through the investigation of coiled baskets from Deir El-medina in display in the Agriculture Museum in Giza. They presented samples of baskets produced during the New Kingdom [6]. Hadidi and Hamdi (2011) presented an anatomical description of identical plants and presented the production of plant footwear, fans and baskets (bags) [7].

Bizzan (2011) wrote an article in Tour Egypt about basketry in ancient and modern Egypt. She pointed out that remains of basket were found in Fayum dating to about 5000 BC [8]. Forshaw (2013) in his Ph. D. Thesis about the role of the lector in the ancient Egyptian society presented scenes

showing basketry usage from Amenemhat Tomb at Bani-Hasan, tomb of the Royal Scribe Idu in the Great Pyramid Complex and tomb of Paury at Thebes [9]. Wikipedia (2016) wrote an article about basket hieroglyph. They listed the use of the basket hieroglyph. They also showed how the basket symbol was used to indicate the 'Lord of the two lands', 'Lord of coronation' and 'Lady of the house' [10].

Balfet (2017) in her article about basketry stated that the ancient Egyptians used mats to cover floor and wall and rolled and un-rolled upon front of doorways of the tombs dating from the Old Kingdom [11]. Hassaan (2017) investigated evolution of mechanical engineering in ancient Egypt through the study of the statuettes of some insects and the mud-bricks industry [12,13].

## II. PREDYNASTIC BASKETRY

The ancient Egyptian as a civilized nation produced baskets from very old times, even before the Predynastic Period. The British Museum displays an ancient Egyptian basket from the Neolithic Period (7000-4500 BC) found at Fayum and shown in Fig.1 [14]. The basket has a perfect oval shape with decreasing dimensions from top to bottom. It seems it simulated a River boat. The basket was decorated by vertical bands distributed over the whole surface of the basket. The material used was not assigned.



Fig.1 Basket from the Neolithic Period [14].

## III. MIDDLE KINGDOM BASKETRY

The Middle Kingdom comprises both the 11<sup>th</sup> and 12<sup>th</sup> Dynasty over a time span from 2050 to 1800 BC [15]. We have a good number of basketry produced during this time period reflecting the basketry production technology and materials. Here are some of the basketry examples:

- The first example is a basket from the Middle Kingdom (2055-1650 BC) in display in the Liverpool Museum at Liverpool, UK and shown in Fig.2 [16]. This is a novel basketry design more than 3700 years old. The body of the basket is cylindrical, while the cover is a conical-tall one. Both produced by the coiling technique using an undefined plant material (may be palm leaves).



Fig.2 Basket from the Middle Kingdom [16].

- The second example is an offering bearer from the 11<sup>th</sup> Dynasty (2033-1900 BC) found at Assiut in display in the Louvre Museum at Paris and shown in Fig.3 [17]. The bearer lady is carrying a basket with an elaborated design with decoration using vertical and horizontal bands in dark color while the basket body is yellow. The basket is well covered to avoid contamination during transport.



Fig.3 Offering bearer from 11<sup>th</sup> Dynasty [17].

- The third example is statuette for a female servant from the 11<sup>th</sup> Dynasty found in the funerary complex of King Mentuhotep II (2061-2010 BC) in display in the British Museum and shown in Fig.4 [18]. This basket had a conical-concave surface with the

smallest dimension at its base. It was decorated by black straight bands in horizontal, vertical and inclined directions.



Fig.4 Offering bearer from 11<sup>th</sup> Dynasty [18].

- The fourth example is from Lahun of Fayum during Late 12<sup>th</sup> Dynasty (before 1802 BC) in display in the Manchester Museum at Manchester, UK and shown in Fig.5 [19]. It has a cord handle while the material of the basket is not assigned.



Fig.5 Basket from Late 12<sup>th</sup> Dynasty [19].

- The fifth example is a an offering bearer from Early-12<sup>th</sup> Dynasty (2000 BC) Tomb 1580 at Sedment of Fayum and shown in Fig.6 [20]. The statue designer selected a cubed basket with decoration bands in the vertical and horizontal directions.



Fig.6 Female bearer from Early 12<sup>th</sup> Dynasty [20].

- The sixth example is a female offering bearer from the 12<sup>th</sup> Dynasty (1985 BC) in display in the Metropolitan Museum of Art at NY and shown in Fig.7 [21]. The basket had a design of conical flat surfaces with square cross-section and decorated by using two different colors and vertical and horizontal lines (two in each direction).
- The seventh example is a basket from the 12<sup>th</sup> Dynasty (1900 BC) in display in the Oriental Institute Museum, University of Chicago and shown in Fig.7 [22]. The basket material is not assigned, however an insight look to Fig.8 reveals a guess that this is a palm fiber. It was produced using the coiling technique and it had no handles.



Fig.7 Female bearer from 12<sup>th</sup> Dynasty [21].



Fig.8 Basket from 12<sup>th</sup> Dynasty [22].

- The eighth example is a fruit basket found at Lahun of Fayum from the 12<sup>th</sup> Dynasty (1877-1773 BC) in display in Liverpool Museum at Liverpool, UK and shown in Fig.9 [23]. The basket was produced, most probably, from palm fiber using the coiling technique and its dimensions were adjusted to take about six fruits of pomegranate.



Fig.9 Fruit basket from 12<sup>th</sup> Dynasty [23].

#### IV. NEW KINGDOM BASKETRY

The New Kingdom comprises the Dynasties from 18 to 20 and expands from 1570 to 1069 BC [24]. This is the most powerful empire during the ancient Egyptian history and we expect to see this power reflected on the basketry industry as depicted by the following examples:

- The first example is a deep basket with lid from the New Kingdom (1570-1070 BC) in display in the Oriental Institute Museum of the University of Chicago at Chicago and shown in Fig.10 [25]. Both basket and lid were produced using the coiling technique and decorated by an inclined patterns of square shapes arranged in two inclined bands having very nice appearance and reflecting high production quality. The is no handles in this basket design.
- The second example is shallow basket without lid from the New Kingdom (1570-1070 BC) in display in the Oriental Institute Museum of the University of Chicago at Chicago and shown in Fig.11 [26]. Again, this basket was produced using the coiling technique , had an increasing diameter and decorated by green triangles arranged on two circular loci. The is no handles in this basket design.



Fig.10 Basket with lid from New Kingdom [25].



Fig.11 Basket without lid from New Kingdom [25].

- The third example is a deep basket without lid with ventilation holes from the New Kingdom (1570-1070 BC) in display in the Oriental Institute Museum of the University of Chicago at Chicago and shown in Fig.12 [25]. The material is completely different than those in the designs in Figs.10 and 11. Probably it was produced from reed.



Fig.12 Basket without lid from New Kingdom [25].

- The fourth example is a 160 mm maximum diameter bread basket from the 18<sup>th</sup> Dynasty (1550 BC) in display in the World Museum at Liverpool, UK and shown in Fig.13 [26]. The basket is of the shallow type with curved conical wall and wide base to hold the bread. Most probably it was produced using palm leaves.
- The fifth example is a 90 mm diameter cylindrical deep basket model from the 18<sup>th</sup> Dynasty (1550-1295 BC) in display in the Metropolitan Museum of Art at NY and shown in Fig.14 [27]. Those genius ancient Egyptians were keen to leave models for most products they used during their daily life including basketry. This model was produced from palm leaves and grass [27].



Fig.13 Bread basket from 18<sup>th</sup> Dynasty [26].



Fig.14 Basket model from 18<sup>th</sup> Dynasty [27].

- The sixth example woven reed hemi-spherical basket from the 18<sup>th</sup> Dynasty (1550-1295 BC) in display by the Sands of Time Ancient Art and shown in Fig.15 [28]. This basket was produced using the coiling technique and decorated by different scenes.



Fig.15 Hemi-spherical basket from 18<sup>th</sup> Dynasty [28].

- The seventh example is a basket with lid from the 18<sup>th</sup> Dynasty during the reign of Amenhotep I (1525-1504 BC) in display in the Metropolitan Museum of Art and shown in Fig.16 [29]. It had a convex body with maximum diameter at the base. The basket was neatly woven using the coiling technique probably using the coiling technique with a new texture shown in the zoomed view in Fig.16.



Fig.16 Basket with lid from 18<sup>th</sup> Dynasty [29].

- The eighth example is a 635 mm oval basket with lid from the 18<sup>th</sup> Dynasty (1492-1433 BC) in display in the Metropolitan Museum of Art and shown in Fig.17 [30]. Both basket and its lid were nicely decorated in creative colored patterns.



Fig.17 Oval basket with lid from 18<sup>th</sup> Dynasty [30].

- The ninth example is a 310 mm circular basket with lid from the 18<sup>th</sup> Dynasty (1492-1473 BC) in display in the Metropolitan Museum of Art and shown in Fig.18 [31]. This is a very neat design and production of a basket manufactured using the coiling technique with halfa grass and palm leaf as materials. The lid provided firm covering of the basket and decorations are similar on both basket and lid. The decorations are zoomed in the same figure for close view of their details.



Fig.18 Circular basket with lid from 18<sup>th</sup> Dynasty [31].

- The tenth example is a 550 x 400 x 245 mm dimensions large oval storage basket with lid from

the 18<sup>th</sup> Dynasty (1492-1473 BC) in display in the Metropolitan Museum of Art and shown in Fig.19 [32]. This is again a very neat design and production of a basket manufactured using the coiling technique with halfa grass and palm leaf as materials. The lid provided firm covering of the basket without decorations. There are thin cords (probably) acting as handles for the basket.



Fig.19 Oval storage basket with lid from 18<sup>th</sup> Dynasty [32].

- The eleventh example is a 110 mm diameter spherical basket with lid from the 18<sup>th</sup> Dynasty (1492-1473 BC) in display in the Metropolitan Museum of Art and shown in Fig.20 [33]. This neat wonderful basket was produced from halfa grass and palm leaf. Both basket body and lid were decorated by square and rectangular shapes arranged in a repeated pattern on the basket body while concave shapes were arranged on the lid in circular loci. There is a relatively cord in the lid centre to use in raising the basket cover in an innovative way. How genius those people in creating new ideas and manufacturing wonderful products using the primitive technology they had.



Fig.20 Spherical basket with lid from 18<sup>th</sup> Dynasty [33].

- The twelfth example is a storage basket from the tomb of Nobel Kha, the Architect of Pharaohs Amenhotep II, Thutmose IV and Amenhotep III of the 18<sup>th</sup> Dynasty (1425-1350 BC) in display in the Egyptian Museum at Turin, Italy and shown in Fig.21 [34]. All the artifacts of this great engineer Kha are elaborate and wonderful including this basket. The basket has two cord-hands and one cord in the center of the lid to raise and lower the lid over the basket body. It was produced using the coiling technique using palm

fronds and strengthening the body vertically by woven bands using the same material. There is no decoration in this basket design, but it is very neat.



Fig.21 Basket with lid of Kha from 18<sup>th</sup> Dynasty [34].

- The thirteenth example is a model of group offering bearers from tomb of Djehuty, Overseer of Works of Pharaoh Hatshepsut of the 18<sup>th</sup> Dynasty (1479-1438 BC) shown in Fig.22 [35]. The model presents four bearers, two of them are girls carrying baskets including some of the offerings as depicted by the zoomed image. One of the baskets is covered while the other is open with jars emerging out of it. Both baskets are decorated by vertical and horizontal bands. All of them have the shape of an inverted part of a rectangular pyramid.



Fig.22 Bearers model from 18<sup>th</sup> Dynasty [35].

- The fourteenth example is an un-lidded basket from the tomb of Architect Kha from the 18<sup>th</sup> Dynasty (1425-1350 BC) in display in the Egyptian Museum at Turin, Italy and shown in Fig.23 [36]. It is a heavy duty tools-basket carried by two heavy ropes as handles and it was probably produced from palm fiber. It has no decorations and produced using the coiling technique.
- The fifteenth example is an oval lidded basket from the tomb of Pharaoh Tutankhamun from the 18<sup>th</sup> Dynasty (1336-1327 BC) full with fruits in display

in the Egyptian Museum at Cairo [37]. It was produced using the coiling technique and its lid had an extra rim to secure the covering process. Both lid and basket body had no decorations.



Fig.23 Basket without lid of Kha from 18<sup>th</sup> Dynasty [36].



Fig.24 Oval basket with lid of Tut from 18<sup>th</sup> Dynasty [37].

## V. LATE PERIOD BASKETRY

The Late period comprises from the 26<sup>th</sup> Dynasty to the 31<sup>st</sup> Dynasty covering a time span from 664 to 332 BC [38]. We have two examples of basketry in the Late Period of ancient Egypt presented as follows:

- The first example is a 92 mm maximum diameter conical-circular basket model without lid from the Late Period (722-332 BC) in display for sale for 1500 US\$ and shown in Fig.25 [39]. It was produced using the coiling technique using the papyrus pith as a material and strengthened with palm fronds. There is no decoration and the base is small and flat. The zoomed view shows how this basket was woven.



Fig.25 Conical basket without lid from Late Period [39].

- The second example is an ivory statue of a bearer man carrying a basket on his head from the 26<sup>th</sup> Dynasty

(664-525 BC) [40]. This engraved scene depicts the basket as a semi-conical one without lid full of fruits or food stuff.



Fig.26 Ivory bearer from 26<sup>th</sup> Dynasty [40].

## VI. CONCLUSION

- The production of basketry in ancient Egypt was investigated.
- The ancient Egyptians used materials such as palm fibers, palm fronds, halfa grass and reed in producing their basketry.
- They documented their basketry industry since the Neolithic Period through leaving basketry samples in their tombs.
- They knew the oval shape more than 6500 years ago and used it in shaping some of their basketry.
- During the Middle Kingdom, basketry with lids and decorations appeared.
- They used basketry during the Middle Kingdom to present offerings to the temples.
- They devised the production of a tall conical lid during the Middle Kingdom.
- They designed basketry having conical, cylindrical, and oval shapes during the Middle Kingdom. Shallow and deep designs appeared also during this period.
- Actual basketry decorations appeared during the New Kingdom either for the basket body or its lid.
- Shallow and deep designs continued to appear during the New Kingdom.
- They used basketry to transmit bread and fruits during the New Kingdom.
- They authorized their basketry industry through leaving typical basketry and models as small as having 90 mm diameter in their tombs during the New Kingdom.
- They used lidded basketry during the 18<sup>th</sup> Dynasty to store fruits.
- During the 18<sup>th</sup> Dynasty they designed spherical, cylindrical, oval and convex basketry.

- Conical and semi-conical basketry appeared during the Late Period.

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