Jan. 19, 1960 J. HENDERSON ET AL 2,921,609

BATTERY FILLING APPARATUS

Filed March 15, 1956

Fig. 2.

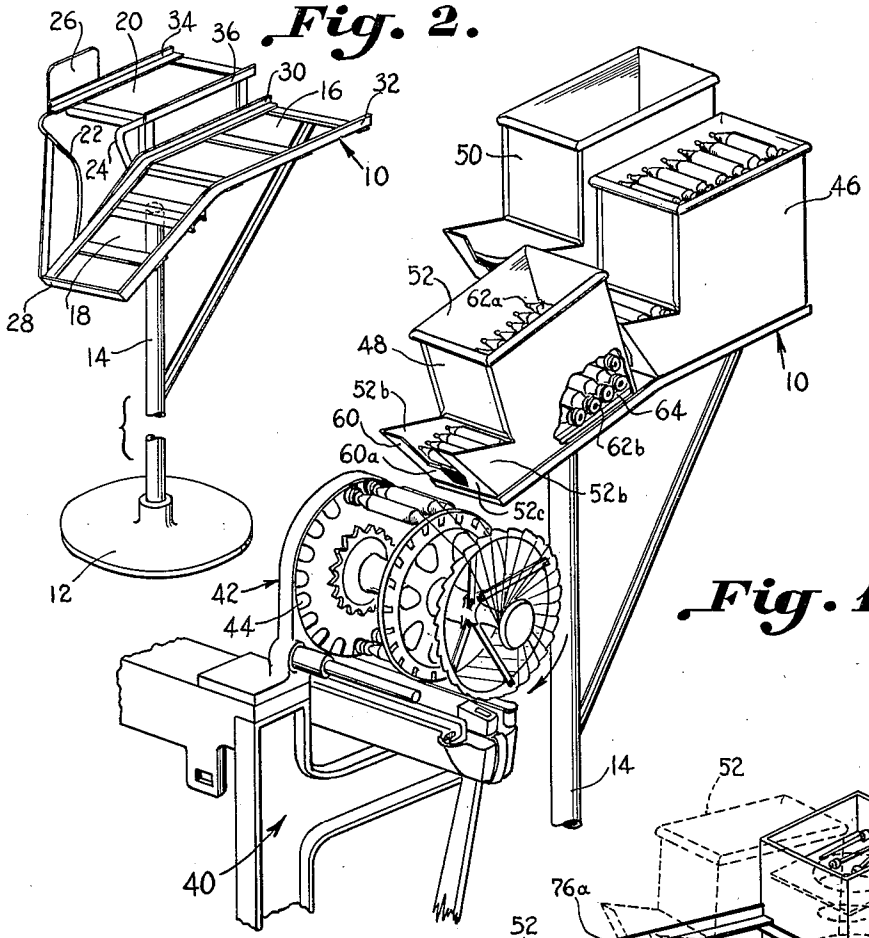


Fig. 1.

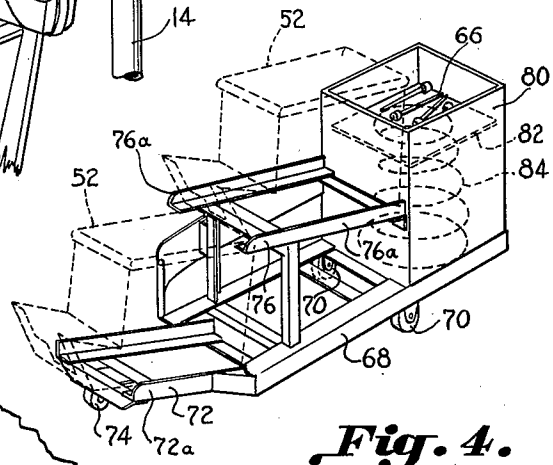


Fig. 4.

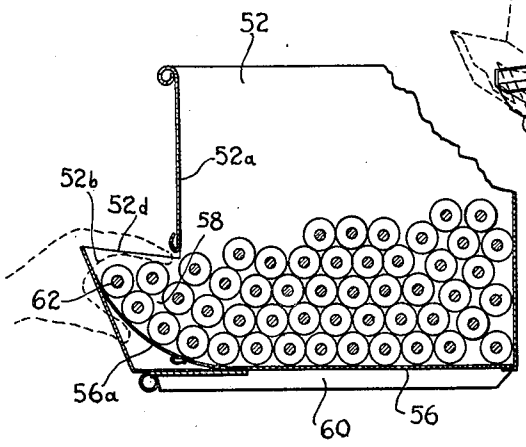


Fig. 3.

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BATTERY FILLING APPARATUS

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5 Claims. (Cl. 139—245)

This invention relates to apparatus and method for handling filling so as to facilitate the operation of filling loom batteries and more especially to a quill box and stand particularly adapted to that purpose.

In normal operation, loom batteries are filled from quill trucks which contain a large number of full bobbins or quills. This necessitates the carrying of a large number of quills from one loom to the other and carrying on this operation often so that considerable man hours are wasted in carrying full quills back and forth from one loom to another. These quills are normally doffed from the spinning frame or quiller, in a random fashion into the quill truck, so that there is inefficiency in picking out a quill to be placed in the loom battery. Many attempts have been made to provide quill boxes which would operate by a gravity feed in order to position full quills either for a direct change operation or for filling the conventional battery. None of these, however, operates with the efficiency and economy of operation as do the method and apparatus described below.

Accordingly, it is an object of this invention to provide a quill box which will be so constructed that it may be positioned so as to be inclined downwardly toward the battery and deliver full bobbins or quills by a gravity feed to a quill discharge opening or chute where these quills may be in one switft manual operation grasped and positioned in the battery by a downward and counterclockwise turning movement of the left hand of the operator.

Another object of this invention is to provide a stand which will position quil boxes so that the discharge opening of one of the quill boxes will be positioned closely adjacent the battery of the loom while a second full quill box may be held in reserve and at the same time a place is provided on the stand for temporarily positioning an empty quill box.

Another object of this invention is to provide a simplified method of delivering quills from the spinning frame or quiller to the loom battery by doffing into a box provided for that purpose and so that the quills may be stacked in an orderly fashion in this quill box and positioning the quill box closely adjacent the battery of a loom.

Still another object of this invention is to provide a suitable truck for carrying quill boxes into which full bobbins may be doffed and a stationary portion having a floating bottom into which empty bobbins may be stored for replacing the doffed quills on the spinning frame or quiller.

Yet another object of this invention is to provide a stand on which a plurality of quill boxes may be positioned so that one of the quill boxes may be held in position so that the quill discharge portion may be positioned closely adjacent the battery of the loom and providing guide means to shift the quill box when it becomes empty to another portion of the stand, while permitting a full quill box to be held in reserve.

We accomplish these and other objects of our invention by providing a quill box adapted to store a plurality of quills in stacked relation and adjacent the battery of a loom consisting essentially of a substantially rectangular open-topped box, an open-topped bobbin discharge portion projecting forwardly from said box, said discharge portion being of substantially less height than the box, a passageway connecting the discharge portion and the box, a front end plate for said discharge portion having an opening cut therein to accommodate the left hand of an operator, a stand for positioning the box so that the discharged opening slants downwardly toward the front, so that quills will be fed from the box by gravity, through the passageway into the discharge opening so that the operator may readily grasp a full quill and position same in the battery.

We further accomplish the objects of our invention by providing a device for maintaining a plurality of quills in stacked relation closely adjacent the battery of the loom comprising a plurality of substantially rectangular open-topped quill boxes each having a forwardly projecting discharge portion, a stand positioned behind the battery, said stand being constructed of suitable structural shapes and including a first horizontally disposed platform, a continuation of said first horizontally disposed platform extending forwardly and downwardly closely adjacent the battery, so that a full quill box may be placed in position to deliver quills by gravity to the discharge portion to be manually placed as needed into the battery while a full quill box may be held in reserve on said first platform, a second horizontally disposed platform positioned adjacent said first platform, and guide means positioned between said continuation and said second platform, whereby empty quill boxes may be moved from the continuation on to said second platform.

We still further accomplish the objects of our invention by providing a method of filling loom batteries with full quills which consists of doffing full quills into an open-topped box having a quill discharge portion projecting forwardly from the box, moving said box containing full quills into the weave room, placing said box on the downwardly and forwardly projecting portion of a stand so that the discharge portion is above and closely adjacent the battery so that quills will be gravity fed into the discharge portion, manually removing full quills one at a time from the box to fill the battery when necessary, placing a reserve quill box behind said first mentioned quill box on a horizontal portion of the stand and, when said first mentioned quill box becomes empty, placing the empty quill box on a second horizontal portion of the stand and then removing said first quill box onto the downwardly and forwardly projecting portion of the stand, whereby a supply of full quills is always available closely adjacent the battery.

Other objects of our invention are accomplished by providing a doffing truck which is adapted to position a pair of quill boxes such as are referred to above so that full quills may be easily doffed into the boxes in stacked relation which consists of a truck platform, a forwardly projecting platform for positioning a full quill box, a slightly elevated platform behind the forwardly projecting platform for positioning a quill box into which quills are doffed and a box having a floating bottom for carrying empty quills to replace the doffed quills positioned at the rear of the truck platform.

While some of the objects of the invention have been stated above, others will become apparent to those skilled in the art relating to spinning and weaving when the specification is read in connection with the accompanying drawing in which:

Fig. 1 is a perspective view showing the battery end

of a loom with our improved apparatus positioned directly behind and above the battery.

Fig. 2 is a perspective view showing our improved stand of positioning quill boxes adjacent the battery.

Fig. 3 is a sectional view of a partially full quill box as shown in Fig. 1, and

Fig. 4 is a perspective view showing a truck used in the operation of doffing full quills into the quill boxes and replacing them on the spinning frame or quiller with empty bobbins.

Referring more particularly to the drawing, the numeral **10** broadly designates the quill box stand which consists substantially of a casting **12** which is adapted to maintain a vertical support or column **14** directly behind the battery of the loom. The stand **10** is suitably secured at the top of the support **14** and is constructed of suitable structural shapes. It will be noted that a first horizontally disposed portion or platform **16** is provided so that a reserve first quill box may be placed thereon while a downwardly and forwardly projecting continuation thereof **18** provides a place for positioning a quill box which is in use. A second horizontally disposed portion or platform **20** for positioning an empty quill box is provided slightly above and in alignment with the portion **16**.

It is important to note that suitable guides in the form of a curved metal bar **22** and another curved metal bar **24** are provided so that the empty quill box may be positioned on the platform **20** provided therefor. The buffer plate **26** is also provided to serve as a guide for the empty quill box. Since all of the parts of the stand just described may be constructed of any suitable structural shapes and preferably secured together by welding further description of the stand is not deemed necessary. It will, however, be noted that a flange **28** prevents further downward movement of the quill box in use while the rear of the platform **16** is open so that the reserve quill box may be slid between the flanges **30** and **32** which serve as guides and confining members for the reserve quill box. The platform **20** is open and the flanges **34** and **36** serve to confine the empty quill box therebetween.

Referring more particularly to Fig. 1, it will be noted that the battery end of a loom is shown, with parts omitted for purposes of illustrating the positioning of the parts of this invention, and is broadly designated at **40**. The customary rotary battery broadly designated at **42** is positioned thereon in the usual manner. The battery **42** is provided with the usual number of spaced portions **44** for positioning full quills therein in position to be transferred successively when the yarn on the bobbin in the shuttle (not shown) becomes exhausted. The battery turns in the direction shown by the arrow. No changes are contemplated in the operation of the battery in so far as the transfer is concerned since it is only with the supplying of full bobbins used in the standard or any desired type of rotary battery that this invention is concerned.

The stand **10** is shown in Fig. 1 as being positioned directly behind and slightly above the battery **42** and the full quill box **46** is shown positioned on the platform **16** to be held in reserve. A partially filled quill box **48** is positioned on the continuation **18** and is in use while the empty quill box **50** is shown positioned on the platform **20** slightly above and along side the reserve quill box **46**.

Fig. 3 shows the particular positioning of the parts of the boxes and how the box is particularly adapted for manually obtaining quills therefrom. All of the quill boxes are constructed in exactly the same fashion as is the quill box **48**. The quill boxes are preferably constructed essentially of sheet metal and consist of an open-topped substantially rectangular portion **52** which is of substantial size and depth. The substantially rectangular box portion **52** is provided with a sheet metal bottom **54** and extends forwardly beyond the box **52** and curves upwardly as at **56***a*.

It will be noted that the forward wall **52***a* does not extend downwardly to the bottom and that the wall **52***a* and the curved bottom portion **56***a* define a passageway **58**. The bottom is further reinforced by wooden runners **60** which are adapted to slide on the various guides provided on the stand **10**. The sides of the box **52** have a pair of forwardly projecting portions **52***b* and the forward wall **52***c* joining the sides **52***b* extends upwardly and outwardly so that the upper edges of the sides **52***b* also slant upwardly from the passageway **58** toward the front as at **52***d*. It is preferable that the various sheet metal portions described be secured together as by spot welding and the wooden members **60** may be secured by any suitable means such as by screws or rivets (not shown).

Referring again to Fig. 1, it will be noted that the front wall **52***c* has a cut-out portion **60** which is located in about the middle of the forward wall **52***c* and is of sufficient size to accommodate the hand of an operator as is shown in dotted lines in Fig. 3. A further downwardly extending cut-out portion **60***a* is provided to accommodate the thumb of the left hand of the operator. It will be noted by further reference to Figs. 1 and 3 that the operator may grasp a full bobbin **62** with the thumb in downward position as shown in Fig. 3 and then the operator's hand may be turned counter-clockwise through an angle of 180 degrees and place the bobbin in the battery as shown in Fig. 1. It has been found from extensive study that this is the most efficient type movement for the carrying out of this operation. The quill discharge opening or quill discharge spout described above is an important element of the invention because the curved bottom **56***a* raises the quills and together with the other parts of the spout provides ready access to individual bobbins obviating the danger of damaging the filling on adjacent bobbins.

The bobins **62** are shown in stacked relation in the quill boxes and are full of yarn. The yarn **62***a* forms a bundle which is larger in diameter than the butt **62***b* of the quill. There is a possibility, therefore, for the bobbins to turn and not be fed properly into the bobbin discharge opening defined by the sides **52***b*, the bottom **56***a* and the front wall **52***c*. A strip **64** is provided, therefor, along the edge of one side of the box **52** and extends throughout its length. Thus the butts of the bobbins roll along the strip **64** as they roll toward the discharge opening.

Fig. 4 shows a quill truck which is particularly adapted for use in the spinning room so that quill boxes **52** may be positioned thereon and so that empty quills **66** may also be carried therein. The truck is constructed essentially of a substantially rectangular chassis **68** and is provided with a pair of wheels **70**. A forwardly and upwardly extending box holding portion or tray **72** is carried at the forward end of the platform **68** and is provided with a front wheel **74**. It will be noted that the forwardly extending portion **72** is provided with a pair of flanges **72***a* so as to position a quill box therebetween. A second quill box positioning portion **76** is positioned above and to the rear of the first quill box holding portion **72** and is also provided with guide flanges **76***a* for the purpose of confining a quill box therebetween.

To the rear of the platform **67** a substantially rectangular box **80** is provided with a floating bottom **82** which is supported by a helical spring **84** so that empty quills **66** may always be removed from the box **80** at the same level since the bottom **82** will adjust in height within the box according to the number of bobbins placed therein. This makes it possible for the spinning frame or quiller to be doffed placing the full quills into the boxes **52** and then replacing the full quills with empty bobbins **66**. This truck never leaves the spinning room and the quill boxes are carried on any suitable type truck into the weave room to be positioned on the stands **10**. The quill boxes are of such a size that they accommodate about 130 full bob-

bins or those from one side of a spinning frame. The box **80** normally holds enough empty bobbins to fill three frames.

In operation therefore, after a quill has been transferred the empty quill is taken from the conventional quill can to a quill cleaning device (not shown). From the cleaning device the quills are placed in the box **80** from whence they are placed on the spinning frame to replace full quills which are doffed into the quill boxes. The quill boxes are then moved by any suitable truck into the weave room where they are supplied as needed to the quill box stands.

While a preferred embodiment of our invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the invention as defined by the appended claims.

We claim as our invention:

1. A device for maintaining a plurality of quills in stacked relation closely adjacent the battery of a loom comprising a plurality of substantially rectangular open-topped quill boxes each having a forwardly projecting quill discharge portion, a stand positioned behind the battery, said stand including a first horizontally disposed platform so that a full quill box may be held in reserve thereon, a continuation of said first horizontally disposed platform extending forwardly and downwardly closely adjacent the battery, so that a full quill box may be placed in position to deliver quills by gravity to the discharge portion to be manually placed as needed into the battery, a second horizontally disposed platform positioned adjacent said first platform and guide means positioned between said continuation and said second platform, whereby empty quill boxes may be moved from the continuation on to said second platform.

2. A device for maintaining a plurality of quills in stacked relation closely adjacent the battery of a loom comprising a plurality of substantially rectangular open-topped quill boxes each having a forwardly projecting quill discharge portion, a stand, a base and column positioning the stand behind and above the battery, said stand including a first horizontally disposed platform so that a ful quill box may be held in reserve thereon, a continuation of said first horizontally disposed platform extending

forwardly and downwardly closely adjacent the battery, so that a full quill box may be placed in position to deliver quills by gravity to the discharge portion to be manually placed as needed into the battery, a second horizontally disposed platform positioned slightly above and in alignment with said first platform and guide means positioned between said continuation and said second platform, whereby empty quill boxes may be moved from the continuation on to said second platform.

3. A quill discharge spout for use with a quill box having a passageway feeding quills by gravity into said spout including, a pair of aligned sides extending outwardly beyond said box when in operable position, a front wall bridging said sides, a bottom portion curving upwardly from the rear extending outwardly beyond said box toward the front wall, and a cutout portion in the front wall and the bottom portion to accommodate the left hand of the operator with the hand in substantially horizontal, downwardly facing position whereby, the quills are raised by gravity feed upon the upwardly curving bottom portion to position for ready access by the operator in a battery filling operation.

4. The structure set forth in claim 3, in which said cutout portion is disposed medially of the spout, and in which the cutout portion extends lower at the right hand side facing the front of the spout to accommodate the thumb of the left hand of the operator.

5. The structure set forth in claim 3, in which said sides project higher toward the front, and in which the front slopes inwardly from the top toward the rear.

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