

June 4, 1957

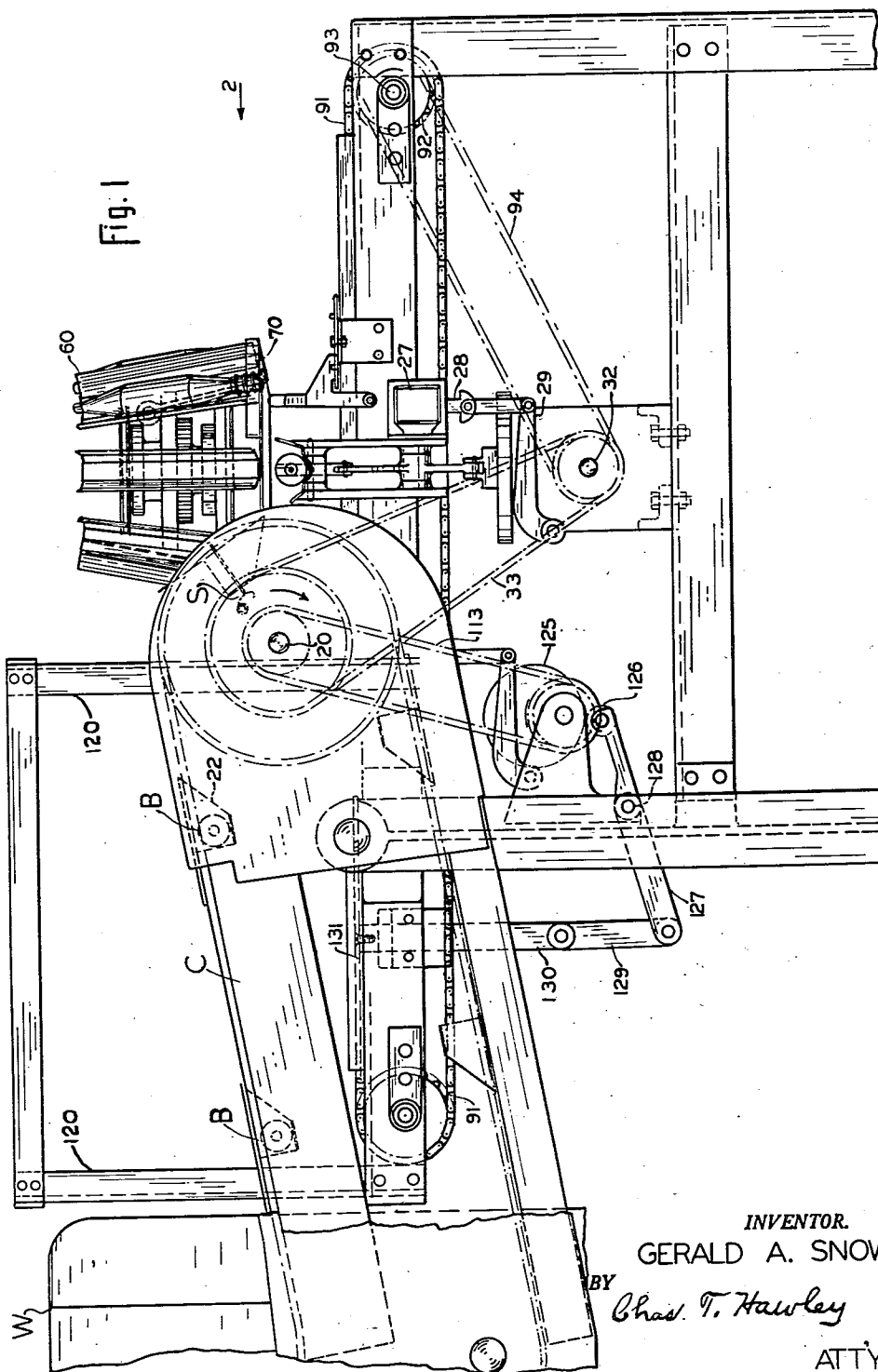
G. A. SNOW

2,794,532

TRANSFER MECHANISM OPERABLE BETWEEN SUCCESSIVE BOBBIN CONVEYORS

Original Filed March 27, 1953

6 Sheets-Sheet 1



June 4, 1957

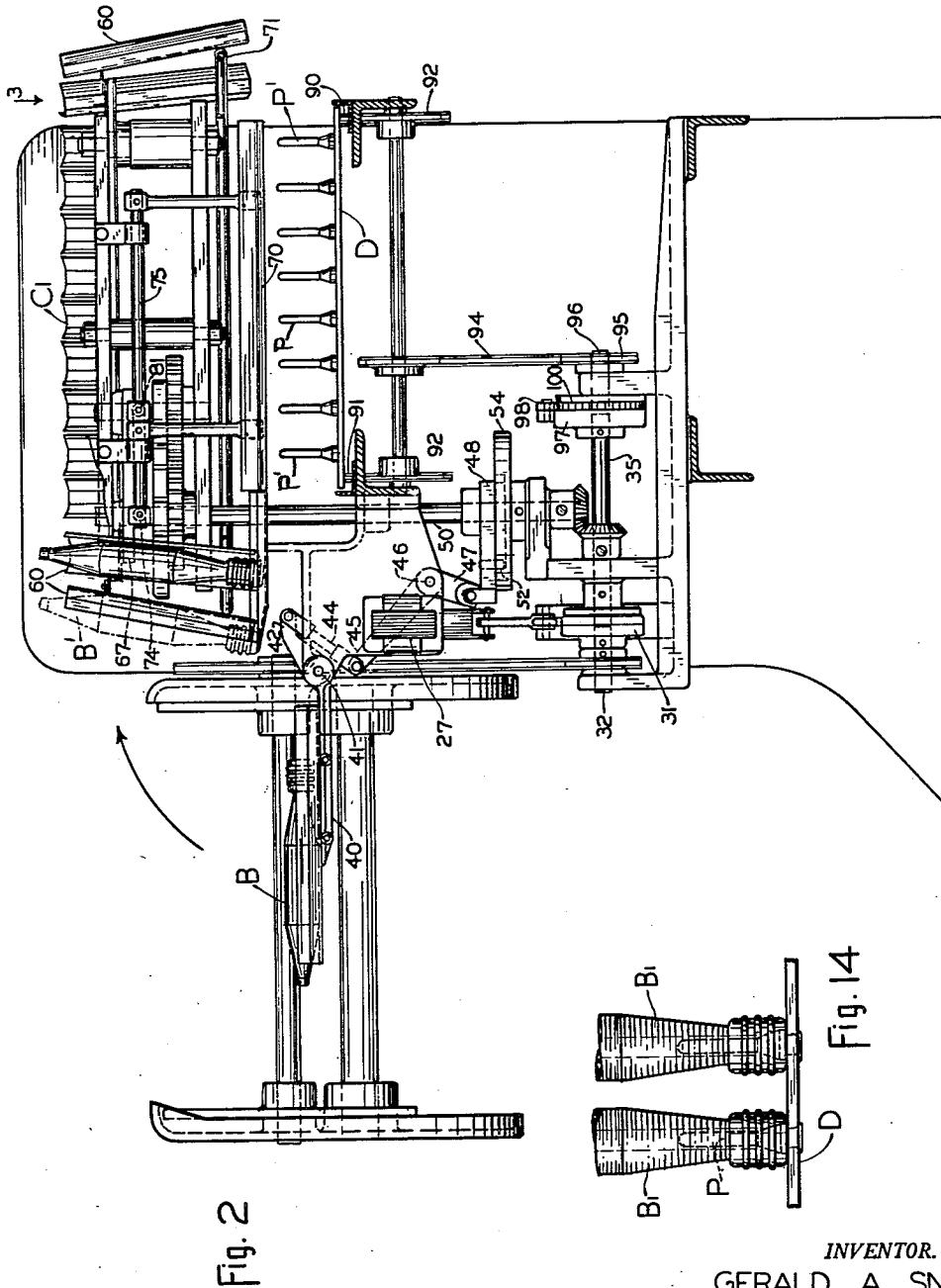
G. A. SNOW

2,794,532

TRANSFER MECHANISM OPERABLE BETWEEN SUCCESSIVE BOBBIN CONVEYORS

Original Filed March 27, 1953

6 Sheets-Sheet 2



INVENTOR.
GERALD A. SNOW
BY
Chas. T. Hawley
ATTY.

June 4, 1957

G. A. SNOW

2,794,532

TRANSFER MECHANISM OPERABLE BETWEEN SUCCESSIVE BOBBIN CONVEYORS

Original Filed March 27, 1953

6 Sheets-Sheet 3

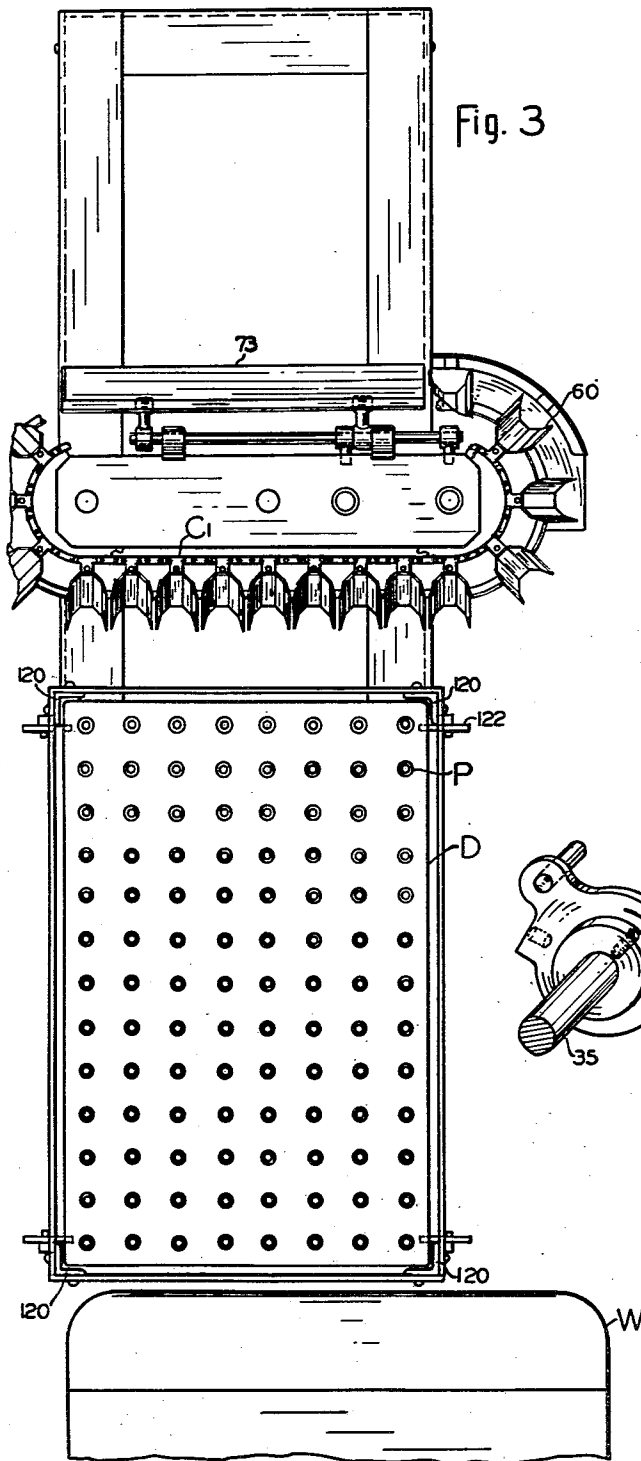


Fig. 3

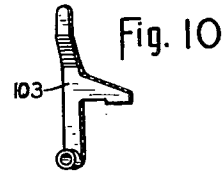


Fig. 10

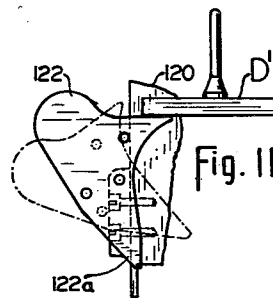


Fig. 11

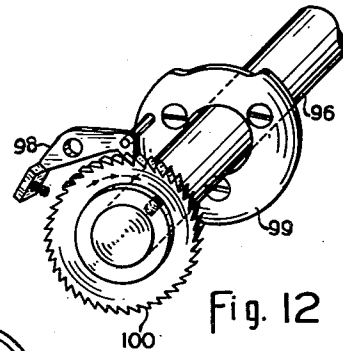


Fig. 12

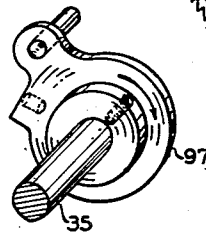
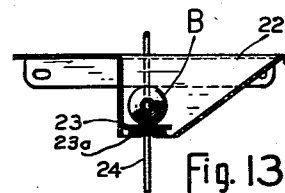


Fig. 13

INVENTOR.
GERALD A. SNOW.
BY *Chas. T. Hawley*
ATT'Y.

June 4, 1957

G. A. SNOW

2,794,532

TRANSFER MECHANISM OPERABLE BETWEEN SUCCESSIVE BOBBIN CONVEYORS

Original Filed March 27, 1953

6 Sheets-Sheet 4

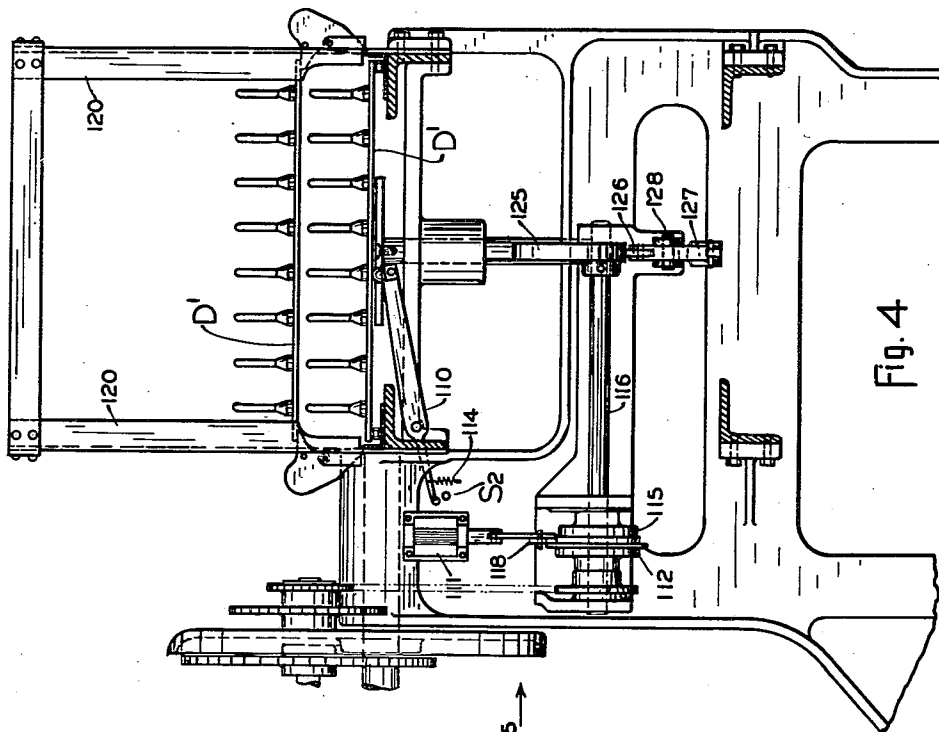


Fig. 4

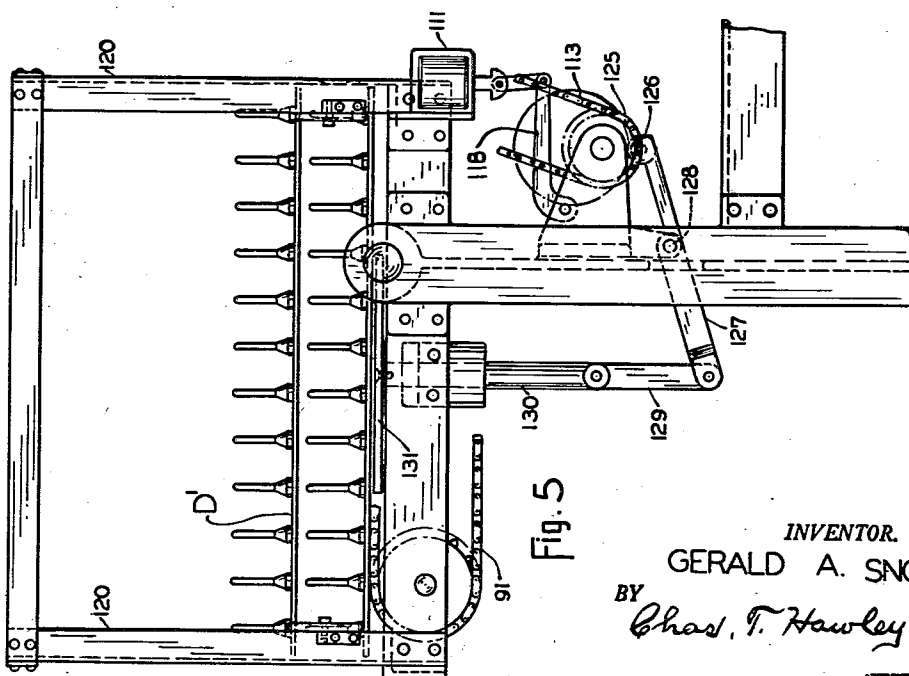


Fig. 5

INVENTOR.
GERALD A. SNOW.
BY *Chas. T. Hawley*
ATT'Y.

June 4, 1957

G. A. SNOW

2,794,532

TRANSFER MECHANISM OPERABLE BETWEEN SUCCESSIVE BOBBIN CONVEYORS

Original Filed March 27, 1953

6 Sheets-Sheet 5

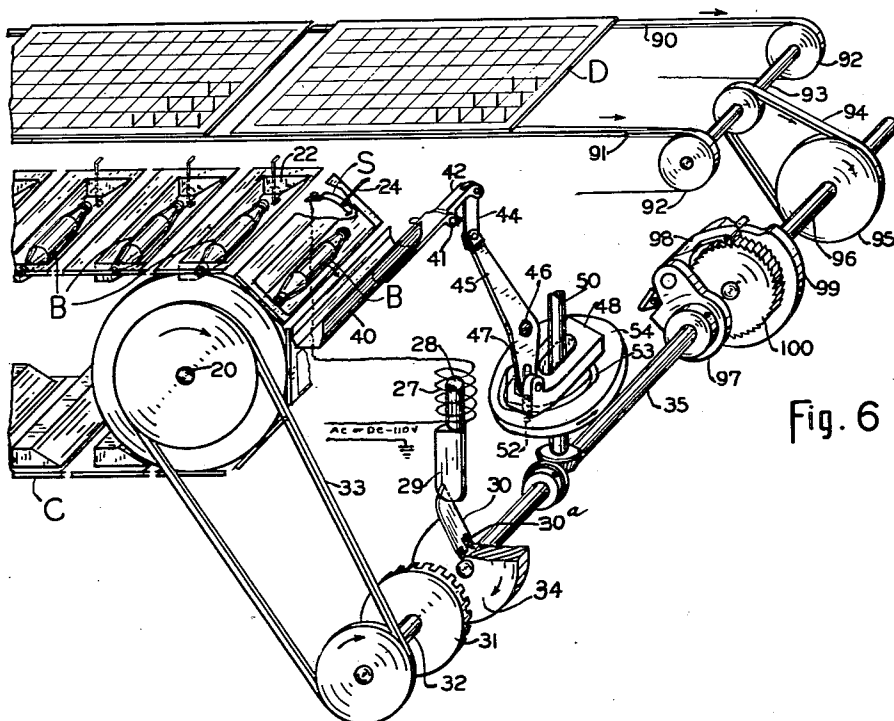


Fig. 6

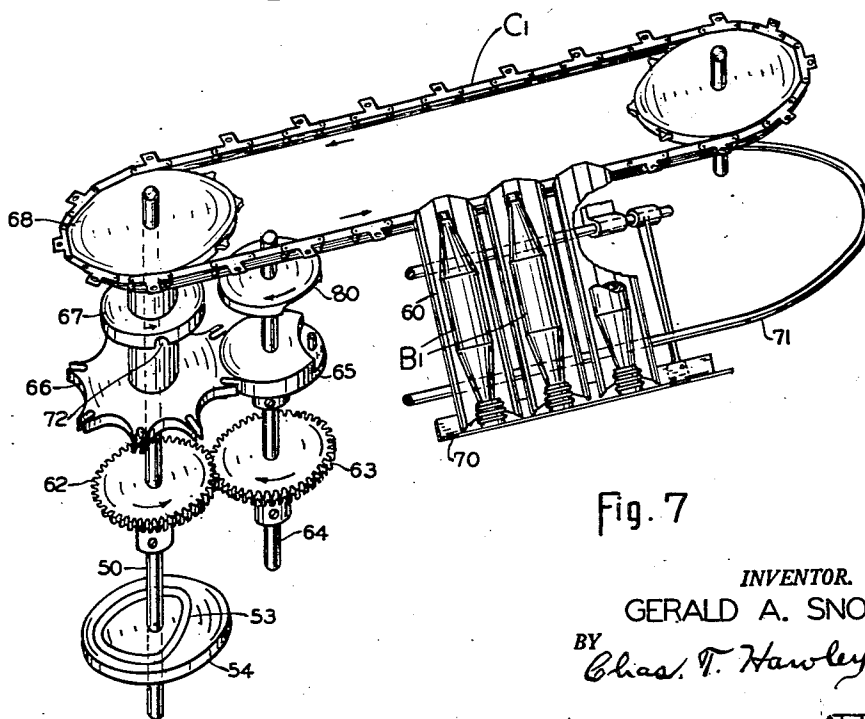


Fig. 7

INVENTOR.

GERALD A. SNOW.

BY

Chas. T. Hawley

ATTY.

June 4, 1957

G. A. SNOW

2,794,532

TRANSFER MECHANISM OPERABLE BETWEEN SUCCESSIVE BOBBIN CONVEYORS

Original Filed March 27, 1953

6 Sheets-Sheet 6

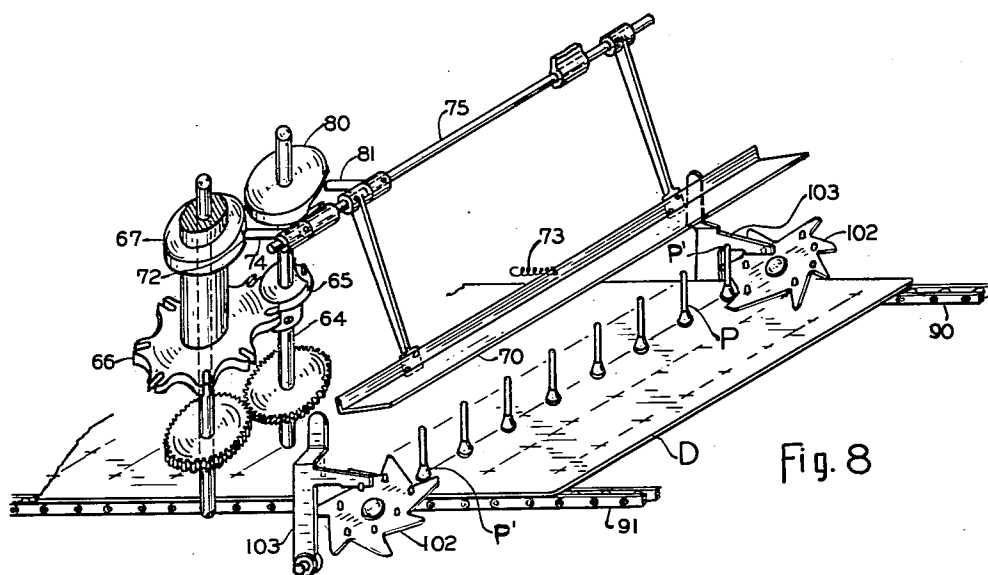


Fig. 8

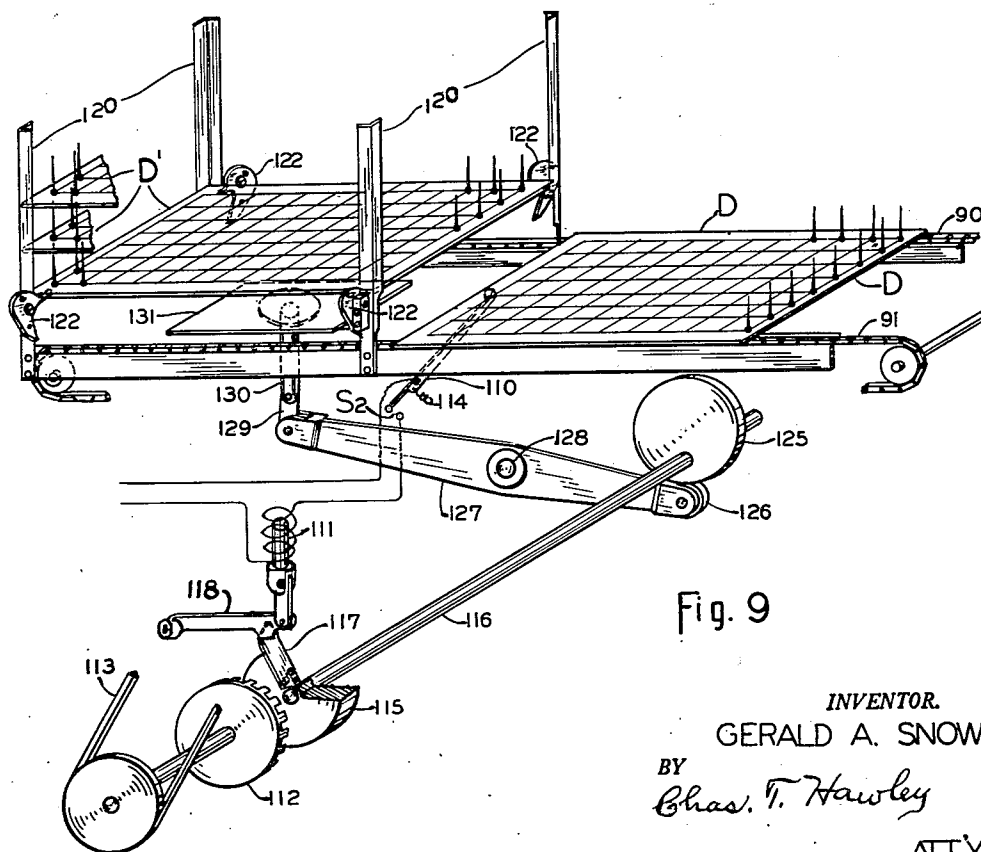


Fig. 9

INVENTOR.
GERALD A. SNOW.
BY
Chas. T. Hawley
ATTY.

1

2,794,532

TRANSFER MECHANISM OPERABLE BETWEEN SUCCESSIVE BOBBIN CONVEYORS

Gerald A. Snow, Falmouth Foreside, Maine, assignor to
Whitin Machine Works, Whitinsville, Mass., a corpo-
ration of Massachusetts

Original application March 27, 1953, Serial No. 344,627.
Divided and this application July 20, 1955, Serial No.
523,298

1 Claim. (Cl. 198—21)

This application is a division of my prior application
Serial No. 344,627, filed March 25, 1953.

Apparatus is known in the winding art by which bobbins
or other weft carries may be wound on a plurality of ad-
jacent winding units and by which the full bobbins from
all units may be deposited on a conveyor for transfer to a
common delivery or discharge point.

In the case of bobbins wound with silk or with any
synthetic thread resembling silk, it is desirable that each
wound bobbin be placed promptly on a separate upright
pin in a so-called "pin-board," which latter may hold
upward of a hundred bobbins. This storage arrangement
prevents injury to delicate threads by accidental contact.

It is the general object of this present invention to pro-
vide improved automatic apparatus for placing the full
bobbins successively on the pins of a pin-board, and for
removing and replacing each pin-board as it is fully loaded.

My invention further relates to arrangements and com-
binations of parts which will be hereinafter described and
more particularly pointed out in the appended claim.

A preferred form of the invention is shown in the draw-
ings, in which

Fig. 1 is a front elevation of my improved pin-board
loading apparatus, together with a portion of a coacting
bucket conveyor;

Fig. 2 is an end view, looking in the direction of the
arrow 2 in Fig. 1;

Fig. 3 is a partial plan view, looking in the direction of
the arrow 3 in Fig. 2;

Fig. 4 is an end view, partly in section, of certain pin-
board replacing mechanism to be described;

Fig. 5 is a partial side elevation, looking in the direction
of the arrow 5 in Fig. 4;

Fig. 6 is a diagrammatic and partially perspective view
of certain parts of the mechanism for removing full bob-
bins from the bucket conveyor and for transferring these
bobbins to the carrier conveyor best shown in Figs. 2 and 7;

Fig. 7 is a perspective view of certain mechanism for
intermittently advancing the carrier conveyor;

Fig. 8 is a perspective view of certain mechanism for
transferring a group of filled bobbins from a series of car-
rier conveyor units to an associated group of pins in a
pin-board, and for thereupon releasing the pin-board for
an advance or feeding movement;

Fig. 9 is a perspective view of mechanism for replacing
a filled pin-board by an empty pin-board from storage;

Fig. 10 is a detail view of a holding latch shown in Fig. 8;

Fig. 11 is a detail view of a holding latch shown in Fig. 9;

Fig. 12 is an exploded view of certain intermittent feed-
ing mechanism shown in Fig. 6;

Fig. 13 is a detail sectional view of a conveyor bucket
to be described; and

Fig. 14 is a fragmentary detail of a portion of a loaded
pin-board.

Referring to Fig. 1, the fully-wound bobbins B from
a series of associated winding units W are deposited on a
chain-type bucket conveyor C which is continuously ad-
vanced by a winding shaft 20. Each conveyor bucket

2

comprises a trough 22 (Fig. 13) having a depressible
bottom plate 23 provided with an upright pin 24 and
normally raised by a spring 23a.

When a full bobbin B is deposited in the trough 22, the
plate 23 and pin 24 are depressed. As the bucket there-
after approaches bobbin-discharge position, the pin 24
closes a switch to complete a circuit which initiates opera-
tion of certain mechanism provided for receiving the full
bobbin and for transferring the full bobbin to the carrier
conveyor, all as best shown in Figs. 2 and 6.

Bobbin transfer to carrier conveyor

Referring to Fig. 6, the depressed pin 24 engages and
closes a switch S mounted in a fixed locus adjacent the
bobbin-discharge position of the machine and located in
a power circuit which contains a solenoid coil 27. This
coil, when energized, raises a plunger 28 having a wedge
member 29 associated therewith. When the switch S is
open, the wedge member 29 holds a swinging latch 30
mounted on a disc 34 out of engagement with a notched
clutch disc 31 on a shaft 32 which is connected by a chain
33 to the conveyor shaft 20. The shaft 20 is continuously
rotated as previously explained.

The swinging latch 30 is yieldingly movable by a spring
30a (Fig. 6) to engage the disc 31.

While the discs 31 and 34 are shown widely spaced for
clearness in the diagrammatic and exploded views of Fig.
6, these parts are closely adjacent in the actual machine.
With the discs 31 and 34 thus closely adjacent, lifting of
the plunger 28 and wedge member 29 by the solenoid coil
27 permits the spring 30a to swing the latch 30 sidewise
in the disc 34 and to thus engage the teeth on the side of
the notched disc 31. The shaft 35 and associated parts
are thus given a single revolution but are again brought
to rest by engagement of the cam-like end surface of the
latch 30 with the coacting cam surface at the lower end of
the member 29. Such engagement swings the latch 30
away from the driving disc 31 and thus stops further rota-
tion of the shaft 35 until the solenoid coil 27 is again
energized.

When the switch S is closed to withdraw the wedge 29,
the latch 30 engages the clutch disc 31 and the associated
shaft 35 is given a single revolution. During this revolu-
tion the switch S is again opened. Also the full bobbin
B is dropped on a trough-like transfer member 40 (Fig.
2) which is then swung upward about its fixed pivot 41
by the following mechanism.

An offset portion or arm 42 (Fig. 2) of the member
40 is connected by a link 44 to an arm 45 pivoted at 46
and having an associated arm 47 which has a pin-and-
slot connection to a slide 48. The slide 48 (Fig. 6) is
slotted to embrace an upright shaft 50 which is gear-driven
from the shaft 35 previously described. A pin 52 in the
slide 48 extends into a cam groove 53 in a disc cam 54
(Fig. 7) secured on the shaft 50.

With these connections, it will be clear that each time
the shaft 35 makes a single revolution, the shaft 50 will
make a similar revolution, and the cam disc 54 will move
the slide 48 to rock the transfer member 40 to shift a
full bobbin B from the horizontal position shown in Fig.
2 to a substantially upright position in one of the carrier
units 60 on the carrier conveyor C' and as shown at B'
in Fig. 2. The cam groove 53 then retains the transfer
member 40 in its normal vertical position from which
it will thereafter be again moved to horizontal position
when another full bobbin approaches transfer position.

Carrier conveyor feed

The means for intermittently advancing the carrier
conveyor C' is best shown in Figs. 6 and 7. The inter-
mittently-advanced shaft 50 is extended above the disc

3

cam 54 and is provided with a gear 62 (Fig. 7) which meshes with an equal gear 63 on a parallel shaft 64.

A Geneva pinion 65 is secured to the shaft 64 and intermittently advances a Geneva gear 66 which is loose on the shaft 50 and which has a disc 67 and a sprocket 68 associated therewith. The carrier units 60, mounted to swing on the conveyor C' associated with the Geneva gear 66, are intermittently advanced by the sprocket 68.

The shaft 64 (Fig. 7) receives one full revolution each time a full bobbin B is dropped onto the transfer member 40, and the associated parts 66, 67 and 68 are advanced $\frac{1}{8}$ of a revolution or 45°.

The conveyor C' is thus advanced one space at each operation of the transfer member 40, so that successive carrier units 60 with full bobbins B' move across the front of the carrier assembly as viewed in Fig. 2 until eight adjacent carrier units 60 have been filled and advanced and are in transverse alignment. The bobbins B' in these aligned carrier units rest on an angle iron or cross bar 70 (Figs. 1 and 8), which normally supports the full bobbins B' in the position shown in Fig. 2. The lower ends of the swinging carrier units 60 are positioned by a fixed guide bar 71.

Bobbin release mechanism

Mechanism best shown in Fig. 8 is provided for depositing a row of bobbins B' on a row of pins P in a pin-board D. For this purpose, the disc 67 (Figs. 7 and 8) is provided with a notch 72 in its under side. The disc 67 normally holds down an arm 74 (Fig. 8) on the shaft 75 which supports the cross bar 70. Once in each revolution of the disc 67, the notch 72 allows the arm 74 to swing upward, and the cross bar 70 is then moved backward by a spring 73 and gravity to release the bobbins B' resting thereon. These eight bobbins thereupon slide downward and are received and held upright by the pins P on an operatively-positioned pin-board D, as shown in Fig. 14.

A cam disc 80 (Fig. 8) is mounted on the upper part of the Geneva pinion shaft 64 and rotates above an arm 81 on the shaft 75 which supports the cross bar 70. The cam disc 80 rotates once with every revolution of the Geneva pinion 65, and on each rotation it swings the cross bar 70 back to supporting position if it has been displaced therefrom. Consequently, when the cross bar is released by the notch 72 and is moved back to discharge its load, it is promptly thereafter returned to holding position by the action of the cam disc 80.

Pin-board release and feed

The pin-boards D rest upon a pair of conveyor chains 90 and 91 (Fig. 6) driven by sprockets 92 on a cross shaft 93 which is connected by a chain 94 and sprocket 95 to a shaft 96 aligned with the shaft 35 previously described. The shaft 35 has an arm 97 supporting a pawl 98 (Fig. 12) which rotates about a fixed annular disc 99. This disc is cut away for a relatively short segment to uncover certain teeth of a ratchet wheel 100 secured on the end of the shaft 96. At each revolution of the shaft 35, the pawl 98 thus advances the ratchet wheel 100 a limited number of teeth and correspondingly advances the chains 90 and 91 which support the pin-board D.

There is no positive connection between the pin-board D and the chains 90 and 91, and the board is normally held from forward movement by the chains by engagement of the end pins P' on the board D with star wheels 102 mounted on fixed pivots and normally held from rotation by latches 103 (Figs. 8 and 10).

When the bar 70 is swung backward to release a load of bobbins, the bar 70 disengages the latches 103 from the star wheels 102, so that the pin-board D may be frictionally advanced one space by the conveyor chains 90 and 91. As the cross bar 70 is returned to supporting posi-

4

tion, the latches 103 are released and again lock the star wheels 102.

Pin-board replacement

I will now describe the mechanism for replacing a loaded pin-board D. As above described, the pin-board D is released for a limited forward movement each time a row of pins P is filled. When the full pin-board D is thus released after the last row of pins has been filled, it continues to travel forward with the chains 90 and 91, and an open space is left at the rear of the pin-board.

A lever 110 (Fig. 9) normally engages the under side of the pin-board but when this open space appears, the lever 110 is rocked by a spring 114 to close a switch S2 which controls a solenoid 111 (Figs. 4 and 5) associated with a one-revolution clutch similar in construction to the clutch 30—31 previously described.

This second clutch comprises a notched disc 112 (Fig. 9) continuously rotated by a chain 113 from the conveyor shaft 20 previously described. A disc 115 is mounted on a short shaft 116 and has a swinging latch 117, normally held out of action by an arm 118. When the switch S2 is closed, the arm 118 is drawn upward, releasing latch 117, which then engages the disc 112.

The shaft 116 thereupon makes a single revolution.

A stack of empty pin-boards D' (Fig. 9) are held in superposed storage between guide-bars 120, and the lowest board is held in slightly raised position by a plurality of latches 122 shown in detail in Fig. 11.

An eccentric 125 (Fig. 9) is mounted on the shaft 116 and engages a roll 126 on a lever 127 mounted on a fixed pivot 128. The lever 127 is connected by a link 129 to a plunger 130 which is provided with a plate 131 which underlies the lowermost pin-board D'.

As the plunger 130, the plate 131 and the stack of empty boards are raised by the eccentric 125, the latches 122 are freed, and these latches are so weighted that they then move out of operative position and no longer support the lowermost pin-board. As the plunger 130 thereafter moves downward, this lowermost pin-board is deposited on the conveyor chains 90 and 91 and is thereafter fed forward to bobbin-receiving position, as indicated by the pin-board D in Fig. 3.

As this lowermost pin-board moves down with the plunger 130, it engages the depending arms or tails 122a (Fig. 11) of the latches 122 and returns the latches to holding position, where they engage and support the next higher empty pin-board D' as it moves downward to reserve position just clear of the chains 90 and 91.

Operation

The general operation of my improved pin-board loading apparatus is as follows:

It is assumed that the parts are in the position indicated in Fig. 2, and with a filled conveyor bucket 22 (Fig. 11) approaching the discharge end of the bucket conveyor C.

The full bobbin B in the bucket 22 holds the pin 24 depressed (see Fig. 13), and as this bucket reaches discharge position, the pin 24 closes the switch S (Fig. 6) which withdraws the wedge 29 and permits the latch 30 to engage the clutch disc 31 and to thereby cause the shaft 35 to make one revolution.

The shaft 50 (Figs. 6 and 7) makes a corresponding revolution, and the cam disc 54 operates through the slide 48 to swing the transfer member 40 upward, thus placing the full bobbin B deposited from the bucket 22 in one of the carrier units 60 in the carrier conveyor C', the bobbin being shown at B' in Fig. 2.

The carrier conveyor C' is then advanced one space by the Geneva pinion 65 and Geneva gear 66 as indicated in Fig. 7.

The pin-board supporting chains 90 and 91 are also given an intermittent advance movement, but the pin-board is held from corresponding advance movement by the star wheels 102.

5

After eight successive advance movements of the carrier conveyor C', the arm 74 (Fig. 8) enters the notch 72, the cross bar 70 is withdrawn, and a row of full bobbins B' from the filled carrier units 60 is dropped on a transverse row of pins P in the pin-board D. The latches 103 (Fig. 8) are momentarily released by the backward movement of the bar 70, and the pin-board D is free to frictionally advance one step by the chains 90 and 91 but is held from further advance by return of the latches 103 to locking position.

This cycle of operations is repeated until the last row of pins in the pin-board D is filled. The next forward movement of the pin-board leaves an open space behind the board which allows the lever 110 (Fig. 4) to move upward and to thereby close the switch S2 (Fig. 9) which causes the shaft 116 to make one full revolution.

During this revolution, the eccentric 125 (Fig. 9) operates initially through the lever 127 to lift the plunger 130, the plate 31 and the stack of empty pin-boards D'. This stack of boards is lifted far enough to release the weighted latches 122, so that on the subsequent return downward movement of the stack, the lowermost pin-board is deposited on the chains 90 and 91. At the same time, the next higher pin-board in the stack is caught and supported in slightly raised position by the latches 122.

This deposited and empty pin-board is then frictionally advanced by the chains 90 and 91 until the first row of pins P is in position to receive bobbins dropped from the carrier units 60. Then the board D is locked and held in this position by the star wheels 102 until its first row of pins P is filled, after which it is advanced one space as previously described.

The operation of the mechanism is thus entirely auto-

6

matic and the attendant merely removes the filled boards from the right-hand end of the conveyor chains 90 and 91 and sees that the stack of empty boards in storage is replenished from time to time.

5 Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:

10 In a pin-board loading mechanism, a continuously-moving collecting conveyor, buckets on said conveyor, a normally-open switch, a switch-closing device on each bucket operatively positioned by depositing a full bobbin therein, a carrier conveyor, means to transfer a full bobbin from said collecting conveyor to said carrier conveyor, a continuously-rotated shaft having a first and notched clutch disc thereon, a second and aligned shaft connected to operate said transfer means and which is normally stationary, a second clutch disc mounted on said second shaft and having a radially-extending arm pivoted 15 therein and swingable sidewise in said second disc to engage said first and notched clutch disc, a solenoid having a wedge-shaped solenoid plunger normally engaging said swinging arm and holding said arm inoperative, and a circuit for said solenoid containing said normally-open 20 switch. 25

References Cited in the file of this patent

UNITED STATES PATENTS

30	1,053,632	Mulholland	Feb. 18, 1913
	1,991,699	Reiners et al.	Feb. 19, 1935
	2,707,548	Furst	May 3, 1955