Oct. 28, 1952 H. W. SPRINGER 2,615,712

FOLD CATCHING MECHANISM FOR CLOTH PILING MACHINES

Filed Nov. 29, 1948 5 Sheets-Sheet 1

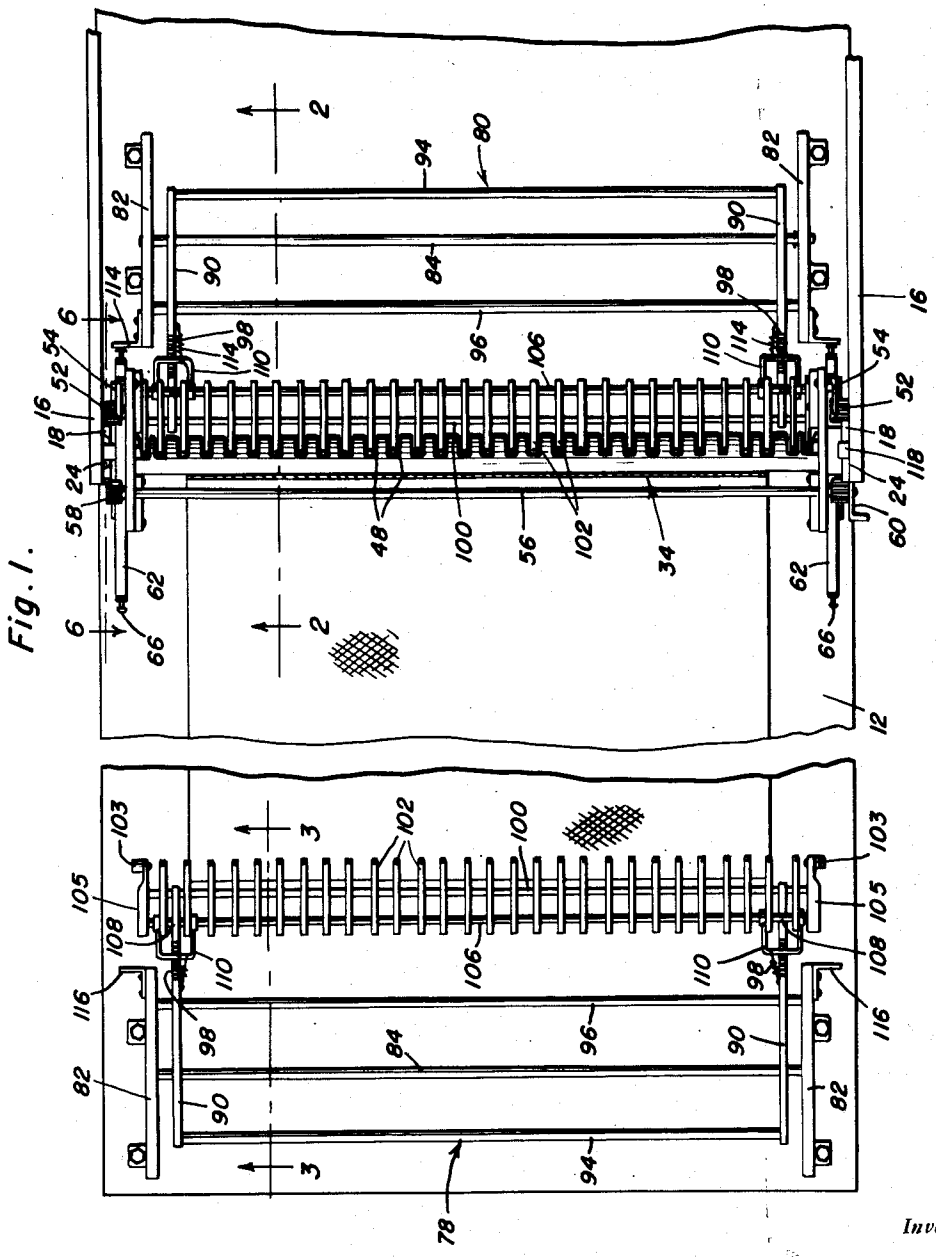


Fig. 1.

Inventor

Herbert W. Springer

By Clarence A. O'Brien and Harvey B. Jackson

Attorneys

Oct. 28, 1952 H. W. SPRINGER 2,615,712

FOLD CATCHING MECHANISM FOR CLOTH PILING MACHINES

Filed Nov. 29, 1948 5 Sheets-Sheet 2

Fig. 2.

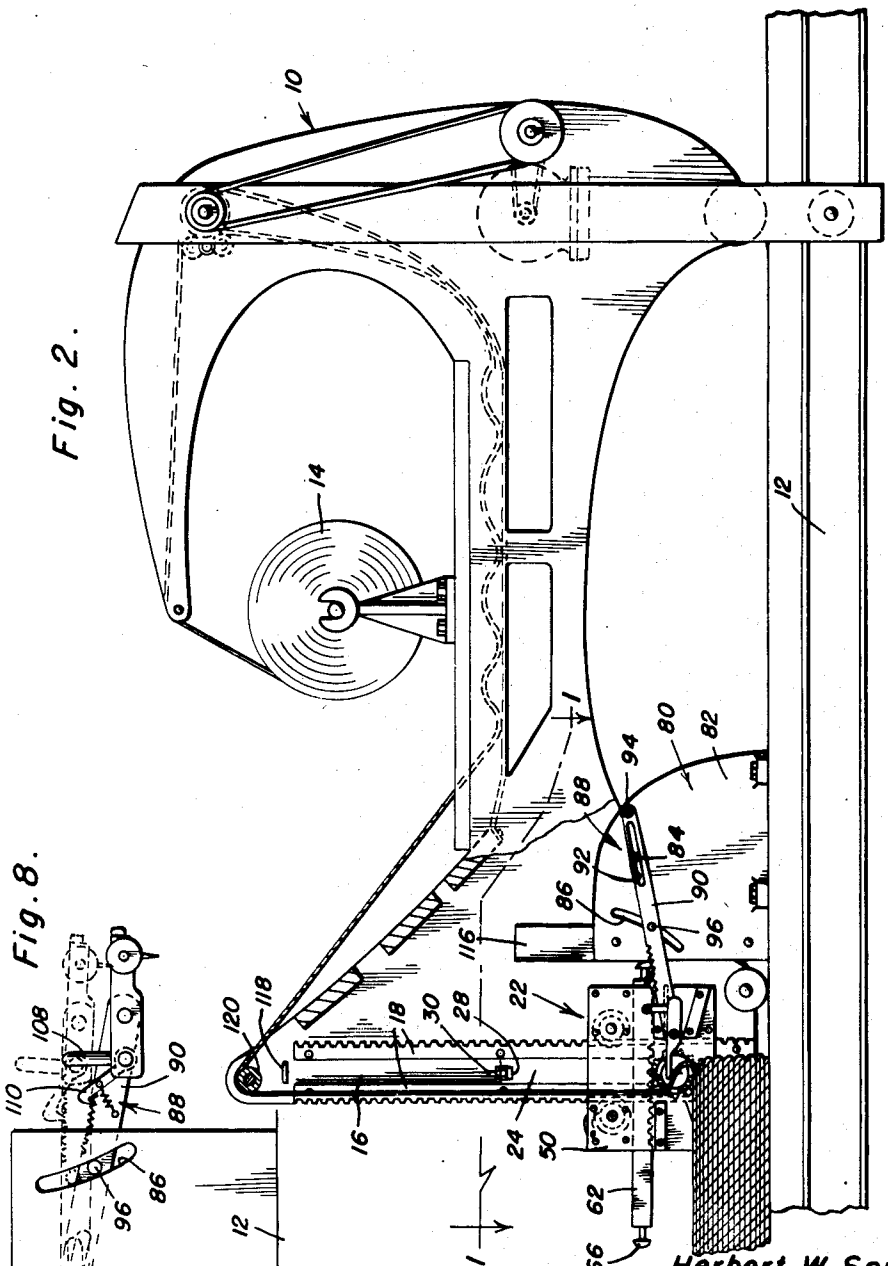


Fig. 8.

Herbert W. Springer
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Oct. 28, 1952 H. W. SPRINGER 2,615,712

FOLD CATCHING MECHANISM FOR CLOTH PILING MACHINES

Filed Nov. 29, 1948 5 Sheets-Sheet 3

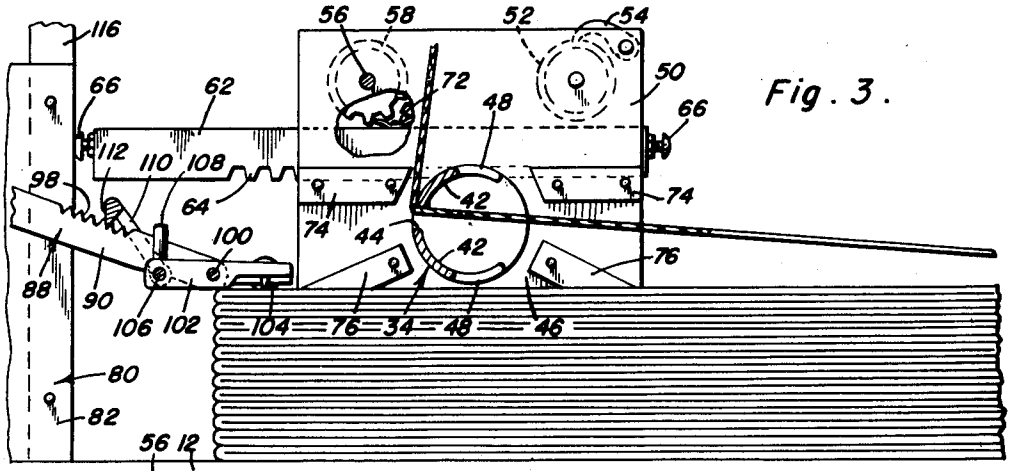


Fig. 3.

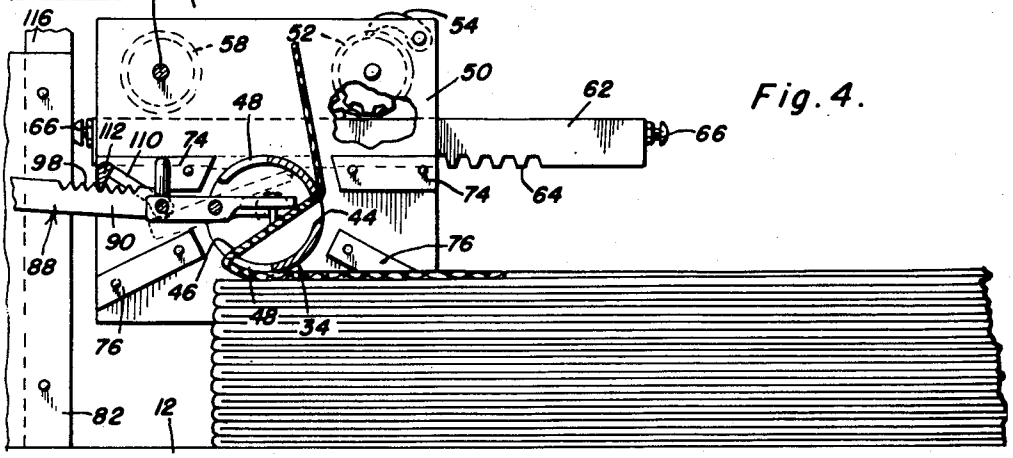


Fig. 4.

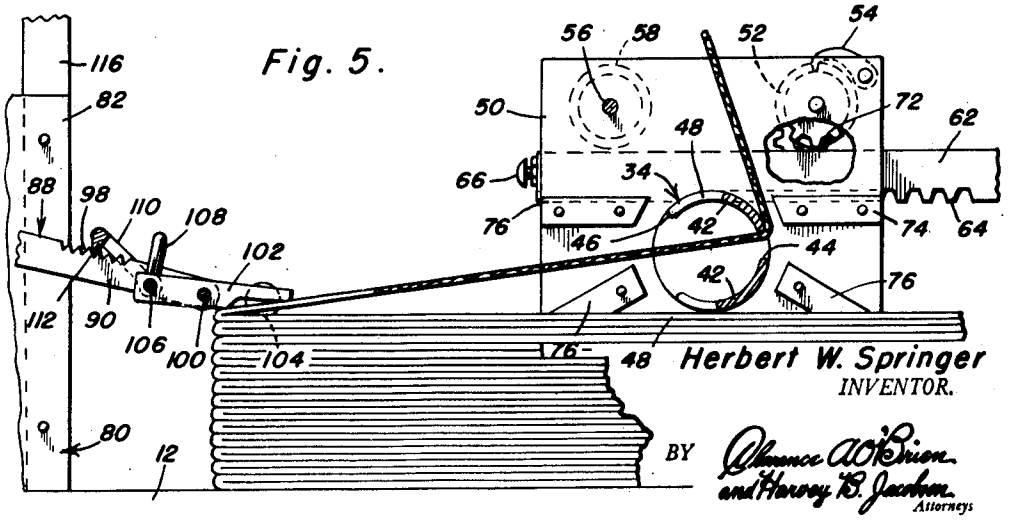


Fig. 5.

Herbert W. Springer
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Oct. 28, 1952 H. W. SPRINGER 2,615,712

FOLD CATCHING MECHANISM FOR CLOTH PILING MACHINES

Filed Nov. 29, 1948 5 Sheets-Sheet 4

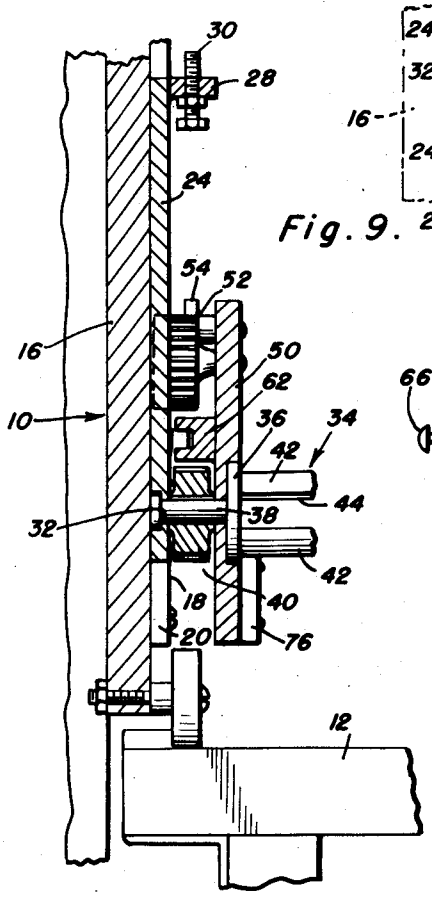


Fig. 9.

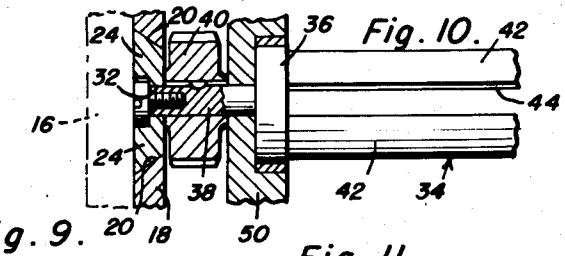


Fig. 10.

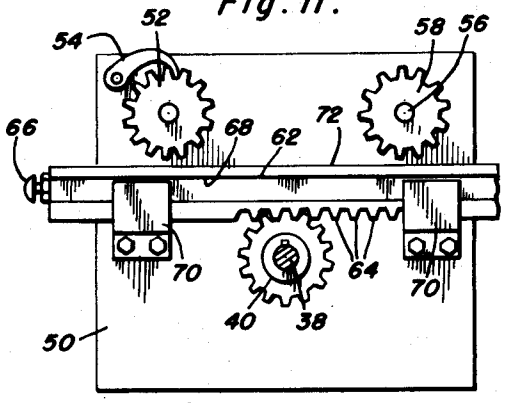


Fig. 11.

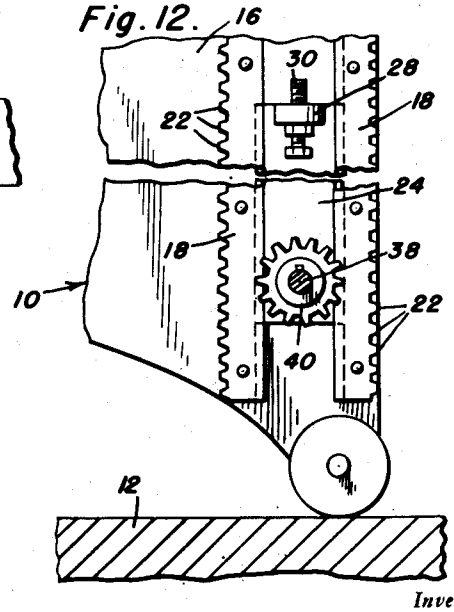


Fig. 12.

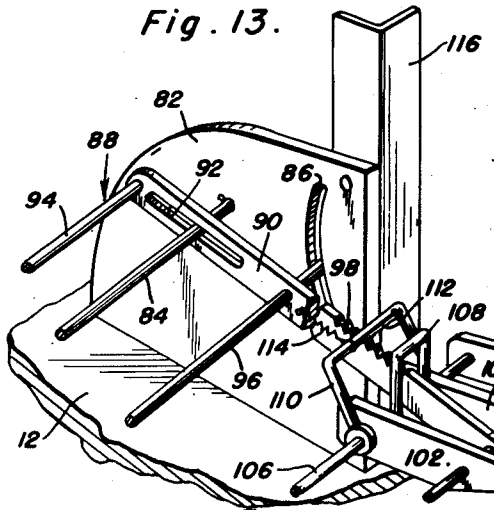


Fig. 13.

Inventor

Herbert W. Springer

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Oct. 28, 1952 H. W. SPRINGER 2,615,712

FOLD CATCHING MECHANISM FOR CLOTH PILING MACHINES

Filed Nov. 29, 1948 5 Sheets-Sheet 5

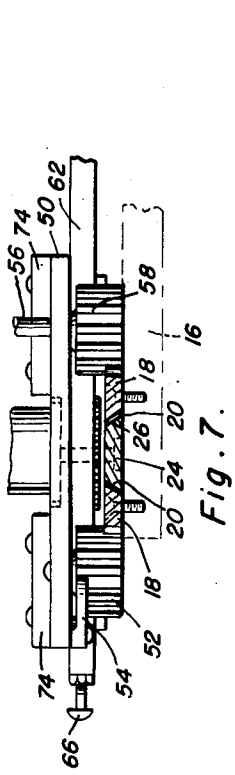


Fig. 7.

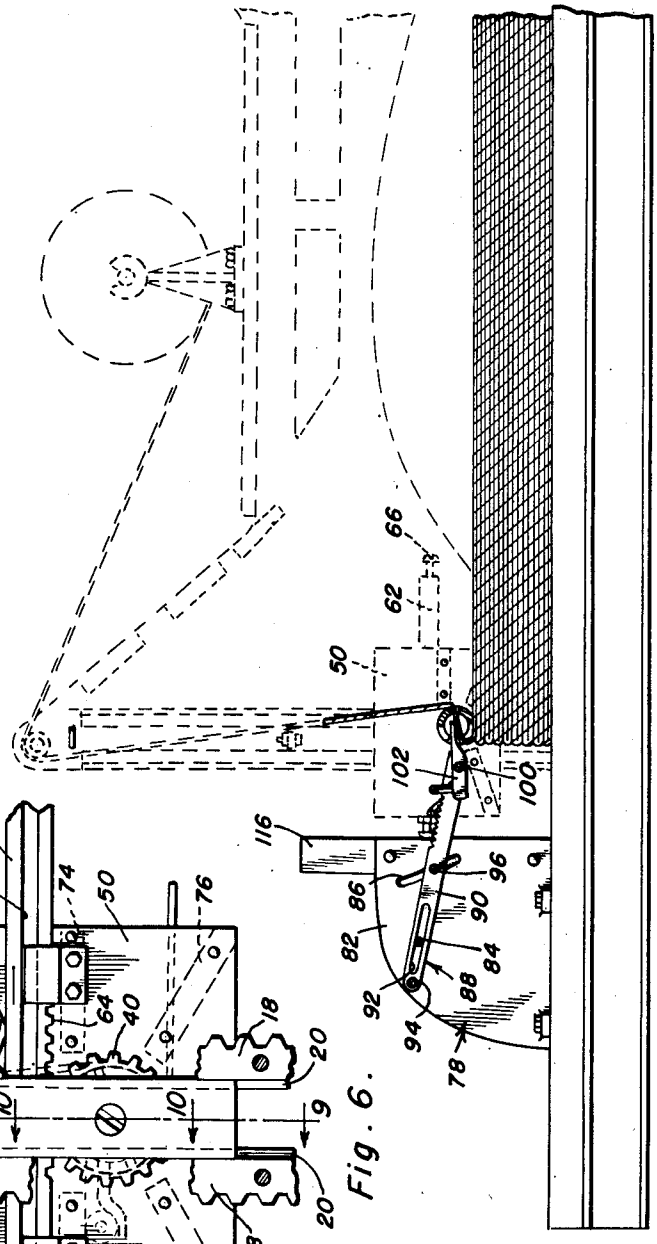


Fig. 20.

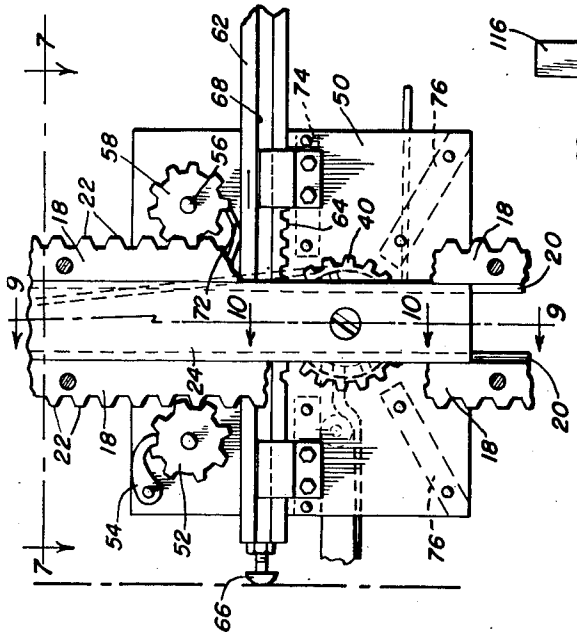


Fig. 6.

Herbert W. Springer
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Patented Oct. 28, 1952 2,615,712

UNITED STATES PATENT OFFICE

2,615,712

FOLD CATCHING MECHANISM FOR CLOTH PILING MACHINES

Herbert W. Springer, Quakertown, Pa.

Application November 29, 1948, Serial No. 62,585

5 Claims. (Cl. 270—31)

1

This invention relates to a cloth piling machine and has for its primary object positively to hold the topmost fold of a cloth pile against movement during the travel of the cloth piling carriage away from the fold.

Another object is to lay cloth on a support in successive folds of uniform width for inspection and other purposes.

Cloth piling or cloth laying machines of the type to which this invention relates generally comprise a carriage mounted to reciprocate to and fro in a rectilinear path above a supporting surface upon which cloth from a supply of cloth carried by the carriage is laid in successive folds by mechanism carried by the carriage and cooperating with fold retaining mechanism supported on the support, adjacent opposite ends of the rectilinear path through which the carriage moves. In most instances the cloth is held on the support adjacent successive folds through the medium of weighted foot members which depend on friction for the purpose of retaining the folds in place, with the result that the cloth leaving the carriage must be fed in a relatively slack condition.

Another object of this invention is to positively hold the successive folds so that as the carriage reciprocates, and the cloth is fed therefrom, the cloth leaving the carriage may be held under considerable tension.

The above and other objects may be attained by employing this invention which embodies among its features a carriage supporting a supply of cloth and mounted to move to and fro in a rectilinear path above a support on which the cloth from said supply is piled in successive folds, a reversible cloth folding bar having a cloth receiving slot extending therethrough mounted on the carriage to oscillate about a longitudinal axis which extends transversely of the rectilinear path through which the carriage moves, cloth catches carried by the support adjacent opposite ends of the rectilinear path for engaging opposite folded edges of the piled cloth and holding said cloth against movement under the influence of pull exerted on the cloth by the carriage as it recedes from a cloth catch, and means on the carriage for lifting a cloth catch clear of the piled cloth and causing it to enter the slot in the folding bar as the carriage approaches the cloth catch.

Other features include means operable by the folding bar reversing means to elevate the folding bar each time that the carriage reaches the end of its movement in the rectilinear path.

2

Still other features include means on the carriage to elevate the folding bar each time the carriage reaches the end of its movement in the rectilinear path, and means on the folding bar elevating means for lifting the cloth catches and guiding them into position to grip the fold of the cloth as it is being deposited on the cloth pile by the folding bar.

In the drawings:

Figure 1 is a fragmentary top plan view of a cloth piling machine embodying the features of this invention.

Figure 2 is a fragmentary side view of the cloth piling machine illustrated in Figure 1.

Figure 2*a* is a fragmentary side view of the end of the machine opposite that illustrated in Figure 2,

Figure 3 is an enlarged fragmentary longitudinal sectional view showing the cloth folding bar approaching one of the cloth catches,

Figure 4 is a view similar to Figure 3 showing the folding bar at the end of its travel and in reversed position, with the cloth catch engaging the cloth passing through the folding bar,

Figure 5 is a view similar to Figure 4 showing the relation of the parts when the folding bar is receding from the cloth catch at the left hand end of the machine,

Figure 6 is an enlarged fragmentary sectional view taken substantially along the line 6—6 of Figure 1,

Figure 7 is a horizontal sectional view taken substantially along the line 7—7 of Figure 6,

Figure 8 is an enlarged side view of one of the cloth catches.

Figure 9 is a vertical sectional view taken substantially along the line 9—9 of Figure 6,

Figure 10 is an enlarged horizontal sectional view through one end of the folding bar and showing in detail the mounting thereof,

Figure 11 is a view of a carriage plate with gears assembled thereon,

Figure 12 is a view of parts of the carriage assembly, and

Figure 13 is an enlarged fragmentary perspective view of one of the cloth catches.

Referring to the drawings in detail, a carriage designated generally 10 is mounted to move to and fro in a rectilinear path above a support or table 12 and carried by the carriage is a supply 14 of cloth to be laid in successive folds on the support or table. Carried at opposite sides of the carriage 10 adjacent one end thereof are uprights or standards 16 and attached to opposed faces of the standards 16 are spaced parallel

vertically extending guide bars 18, the opposed faces of which are undercut as at 20 (Figure 7) to form in conjunction with an adjacent standard or upright 16 a vertically extending dovetail shaped channel. The opposite edges of the vertically extending guide bars 18 are provided with spaced teeth 22 forming vertically extending racks for a purpose to be more fully hereinafter disclosed.

Mounted for vertical sliding movement in the dovetail channel formed between each pair of guide bars 18 is a guide member 24, opposite side edges of which are beveled as at 26 (Figure 7) to engage the undercut portions 20 of the guide bars 18 and retain the guide members in the dovetail shaped channels. Extending inwardly from the upper end of each guide member 24 is a stop 28 carrying an adjustable stop screw 30 which serves to limit upward movement of its respective guide member in its respective channel. Formed near the lower end of each guide 24 is a transverse horizontal opening 32. The opening 32 in the guides 24 on opposite sides of the carriage 10 align axially and form bearings in which are received the trunnions of the cloth folding bar to be more fully hereinafter described.

A cloth folding bar designated generally 34 extends horizontally between the guides 24 and each such bar comprises a pair of cap members 36 each carrying an axial trunnion 38 which is journaled in the opening 32 of an adjacent guide member 24. Keyed or otherwise fixed to each trunnion 38 for turning movement with said trunnion 38 between the cup member 36 and the guide member 24 in which the trunnion is journaled, is a pinion 40 by means of which the trunnion 38 may be turned in its respective opening 32. Fixed to opposed faces of the cup members 36 and extending horizontally across the carriage 10 are transversely arcuate bars 42 forming a substantially tubular folding bar having longitudinally extending guide slots 44 and 46 (Figure 4). Extending through the edges of the arcuate bars 42 which define the slot 46 are longitudinally spaced slots 48 which accommodate the spurs of the cloth catches to be more fully hereinafter described.

Carried on each trunnion 38 is a plate 50 (Figs. 6, 7 and 9) and mounted on the plate 50 for rotation above a horizontal axis on one side of the vertical guide bars 18 is a gear 52 which meshes with the teeth 22 on one of the guide bars 18. A latch dog 54 is pivoted to the plate 50 and engages the teeth of the gear 52 to hold the assembly against downward movement. Extending horizontally across the carriage 10 and journaled in the plates 50 on the side of the guide bars 18 remote from the gear 52 is a shaft 56 (Fig. 1) adjacent opposite ends of which are fixed gears 58 which have meshing engagement with the rack teeth 22 on the vertical guide bars 18 opposite those engaged by the gears 52. A suitable crank arm 60 (Fig. 1) is fixed to one end of the shaft 56 by which rotation of the gears 58 may be manually controlled.

As illustrated in the drawings the axes of the gears 52 and 58 lie in a horizontal plane above the axis of the gear 40 and mounted for horizontal sliding movement on each side of the carriage perpendicular to the axes of the gears 40, 52 and 58 is a push rod 62 carrying on its under side longitudinally spaced teeth 64 which have meshing engagement with the gear 40 on its respective side of the carriage 10. Longitudinally adjustable stops 66 are carried by opposite ends of each push rod in order to assure accuracy in the operation thereof. Each push rod 62 is provided in one side face with an elongated longitudinal groove 68 and suitable guides 70 are fixed to each plate 50 to enter the slot 68 in an adjacent push rod 62 to retain it in a horizontal position. Carried by the top face of each push rod 62 and projecting upwardly therefrom is a dog 72 which engages the gear 52 when the push rod is moved in one direction to rotate said gear a distance equal to one tooth. When the push rod reaches its limit of movement in the opposite direction, the dog 72 engages the gear 58 and rotates it a distance equal to one tooth. In this way the guide members 24 and the folding bar 34 are elevated in a step by step manner each time the carriage 10 reaches an end of its to and fro motion.

Secured to the face of each plate 50 remote from the gears 40, 52 and 58, and on opposite sides of the folding bar 34 are horizontally extending guide bars 74 and inclined guide bars 76 which slope downwardly as they recede from the folding bar 34. These guide bars 74 and 76 form oppositely disposed guide channels on opposite sides of the carriage and serve to elevate the cloth catches to be more fully hereinafter described.

Carried by the support or table 12 adjacent opposite ends of the rectilinear path through which the carriage 10 moves are cloth catches designated generally 78 and 80. These cloth catches are exact counterparts of one another and each comprises a pair of spaced upwardly extending parallel plates 82. Carried by the plates 82 of each cloth catch 78 and 80 and extending therebetween in upwardly spaced relation to the support or table 12 is a horizontally disposed tie bar 84 and formed in each plate 82 between the tie bar 84 and the edge which faces the folding bar 34 is a forwardly and downwardly curved slot 86.

A frame designated generally 88 works between oppositely disposed plates 82 and comprises a pair of arms 90 each of which is slotted as at 92 to receive the tie bar 84. These arms project toward the folding bar 34 of the carriage 10 and are connected together by tie bars 94 and 96 the latter of which is extended beyond the arms 90 and enter the slots 86 to cooperate with the tie bar 84 in supporting the frame 88 for receding movement as it moves upwardly in response to the increase in height of the cloth as it is piled on the support. Each arm 90 is provided in its upper edge intermediate its ends with a row of longitudinally spaced V-shaped notches 98 and rockably supported in the arms 90 adjacent the ends thereof remote from the tie bar 94 is a rock shaft 100. Fixed to the rock shaft 100 and extending forwardly therefrom beyond the ends of the arms 90 are cloth engaging fingers 102 carrying adjacent their extreme forward ends depending cloth penetrating spurs 104. The fingers 102 on the cloth catches are so spaced longitudinally on the rock shaft 100 that they register with the notches 48 in the cloth folding bar 34 on the carriage 10. Extending through the fingers 102 adjacent the ends thereof remote from the spurs 104 is a tie bar 106 which is provided near each end with an inverted U-shaped yoke 108, the bight portion of which bridges an arm 90 in spaced relation thereto. Pivotally supported on the tie bar 106 is a latch yoke 110 the bight portion of which is provided with a knife edge 112 which cooperates with the notches 98 in holding the fingers at various angles with relation to

the frame 88. A retractile coil spring 114 is coupled at one end to an arm 90 and at its opposite end to an adjacent yoke 110 yieldingly to hold the knife edge 112 thereof in a notch 98. Fixed to each end of the rock shaft 100 and extending forwardly therefrom in parallel relation to the cloth engaging fingers 102 is an actuating lever 105 adjacent the extreme forward end of which is mounted to rotate about a horizontal axis a roller 103. The axes of the rollers 103 of each cloth catch align and are so positioned as to be received in the guide channels formed between the guide bars 74 and 76 on opposite sides of the carriage. Fixed to each plate 82 and extending upwardly therefrom in the path of movement of each push rod 62 is a stop 116 which engages an adjustable stop 66 as the carriage 10 approaches the ends of its to and fro movements.

A stop 118 projects outwardly from each standard or upright 16 in the path of movement of the stop screws 30 carried by the guide members 24 and mounted for rotation between the uprights or standards 16 adjacent the upper ends thereof is a horizontal cloth guiding roller 120 over which cloth passing from the cloth supply 14 passes on its way to the folding bar 34.

In operation a supply of cloth 14 is mounted on the carriage and the cloth therefrom is passed over the guide roller 120 from whence it extends downwardly through the slots 44 and 46 in the folding bar 34. The end edge of the cloth is then positioned beneath the fingers 102 of one of the cloth catches 78 or 80 and the carriage is moved in its rectilinear path away from the fixed edge of the cloth, thus pulling cloth off of the cloth supply 14 through the folding bar 34 and depositing it as a layer on the support or table 12. As the carriage approaches the end of its travel away from the fixed end of the cloth, the adjustable stops 66 on the ends of the push rods 62 will engage the stops 116 and upon further movement of the carriage the teeth 64 on the push rods will rotate the gears 48 and reverse the position of the folding bar 34. As the folding bar 34 attains its reversed position, the rollers 103 carried by the ends of the levers 105 will engage the inclined guides 76 and rock the fingers 102 upwardly to cause them to enter the folding bar as illustrated in dotted lines in Figure 4. The spurs 104 then enter the folded cloth adjacent the fold thereof and as the carriage starts on its return, the cloth is laid in the next successive layer. Reciprocal movement of the push rods 62 will cause the dogs 72 alternately to engage the teeth of the gears 52 and 58 and cause first one gear and then the other to be moved a distance of one tooth. Such movement of the gears will cause the vertical movable guides 24 to move upwardly between the guide bars 18 and to carry the folding bar 34 upwardly with a step by step motion as the height of the cloth pile increases. Reverse motion of the gears 52 and 58 and hence accidental lowering of the folding bar 34 is prevented by the engagement of the dogs 54 with the gears 52. When the folding bar 34 has reached its upper limit of travel the latch dogs 54 may be disengaged from the gears 52 and the speed at which the parts are returned to lowered position may be governed by the crank arm 60.

This application is a continuation-in-part of my application Serial Number 584,919, now abandoned.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention, what is claimed as new is:

1. In a cloth piling machine in which a carriage supporting a supply of cloth moves to and fro in a rectilinear path above a support on which the cloth from said supply is piled in successive folds, a cloth folding bar having an elongated longitudinal cloth receiving slot extending therethrough mounted on the carriage to oscillate about a horizontal axis which is transverse to the rectilinear path, cloth catches carried by the support adjacent opposite ends of the rectilinear path for engaging opposite folded edges of the piled cloth and holding the cloth against movement, means on the carriage for lifting the cloth catches clear of the piled cloth and causing said catches to enter said slot, vertical racks carried by said carriage, a guide member mounted for vertical movement between pairs of said racks, said folding bar being carried by a pair of said guide members, a pinion fixed to said bar, a plate carried by said bar, gears carried by said plate and enmeshed with the teeth of said pair of racks, a push rod mounted for horizontal movement and engaging said pinion to rotate said bar, and means carried by said push rod and engaging said gears to rotate said gears, thereby moving said plate in response to movement of said push rod.

2. The machine defined in claim 1 and a latch dog carried by said plate and engaging the teeth of one of said gears to hold said plate against downward vertical movement.

3. The machine defined in claim 1 and a latch dog carried by said plate and engaging the teeth of one of said gears to hold said plate against downward vertical movement, and means on said plate engaging said push rod to constrain said push rod to move in a horizontal path.

4. The combination of claim 1 and an adjustable stop carried by the outer end of said push rod to engage an abutment for limiting the movement of said push rod.

5. The machine defined in claim 1 and stops operatively connected with each of said guide members for limiting the vertical upward movement of said guide members.

HERBERT W. SPRINGER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,257,421	Sussman et al.	Feb. 26, 1918
2,442,352	Gilbert et al.	June 1, 1948
2,520,895	Gilbert	Aug. 29, 1950