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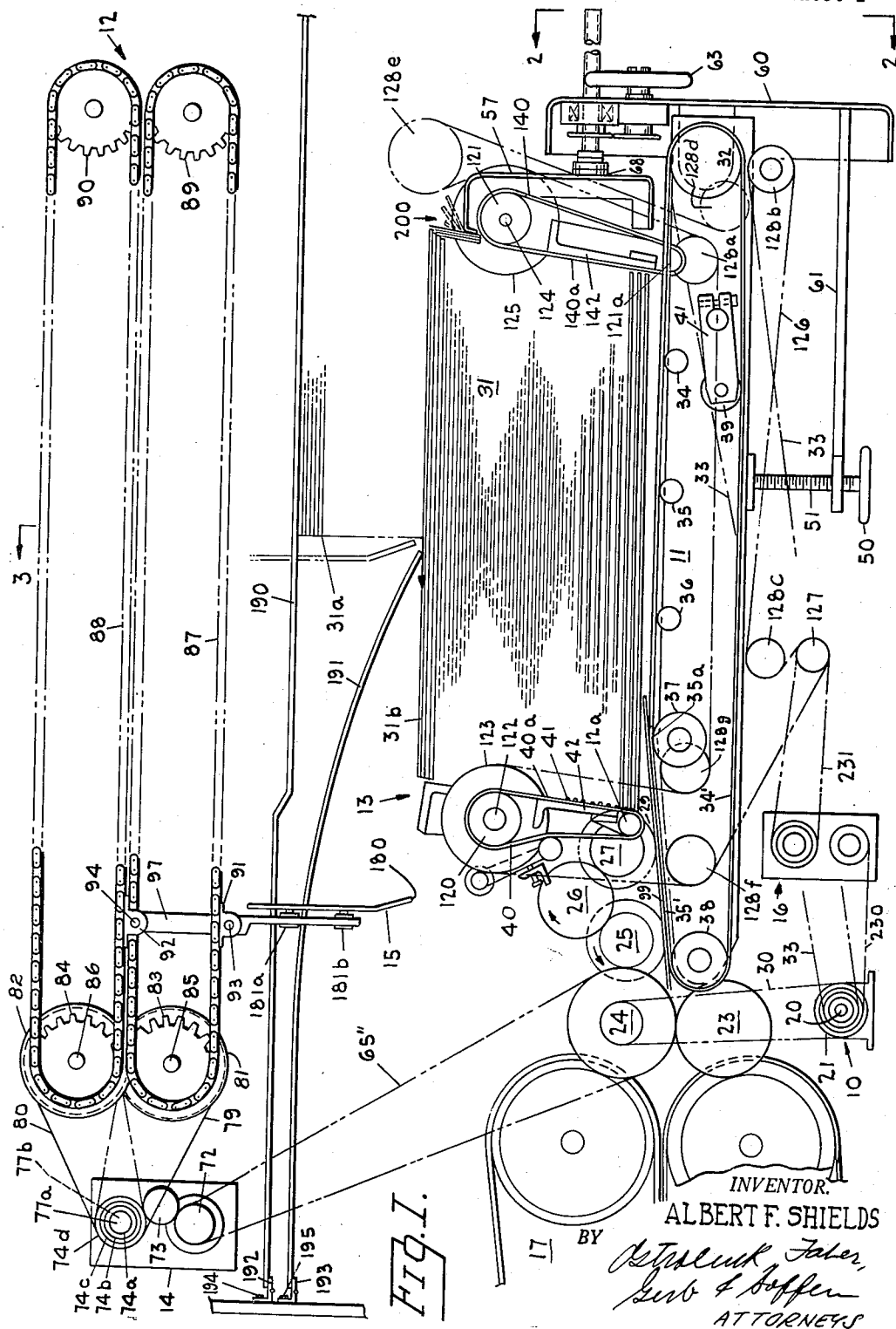
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BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

Filed March 13, 1957

2 Sheets-Sheet 1



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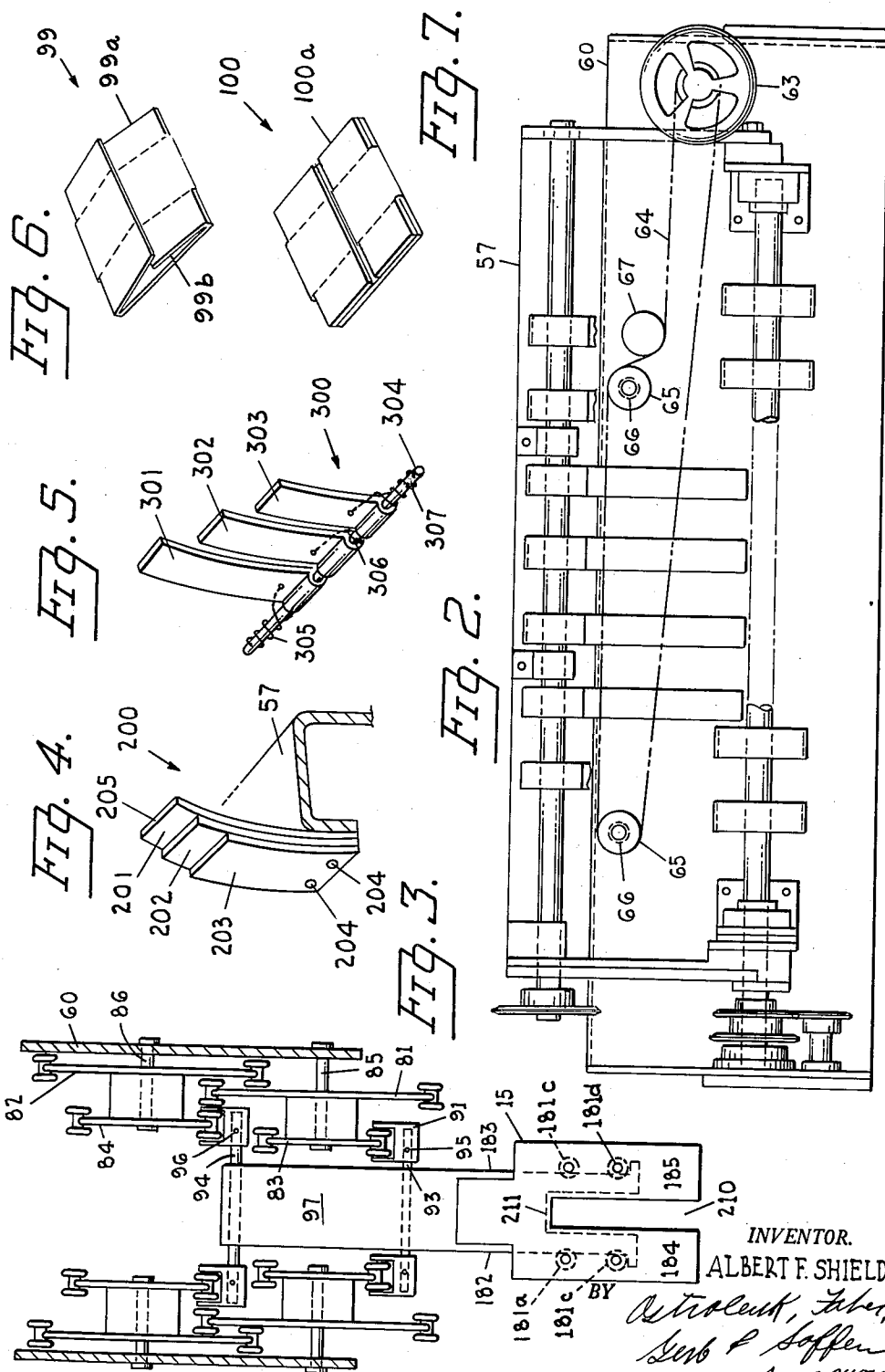
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BLANK STACKING, STRAIGHTENING AND DELIVERY DEVICE

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14 Claims. (Cl. 214—6)

This invention relates to a blank stacking, straightening and delivery device and, more particularly, to a device wherein movable belts are utilized for piling and straightening the stack of blanks. The instant application is a continuation in part of my copending application Serial No. 626,100, filed December 4, 1956.

The device of the present invention finds particular application in instances where box blanks are operated on rapidly and must be subsequently delivered rapidly to the next processing operation without the necessity of uneconomical hand operations. More particularly, the present device has specific utility in instances where blanks are being ejected singly and rapidly from a high speed folding and gluing machine.

In accordance with the present invention, this result is obtained by combining, in a single automatic device, which is readily synchronized with the movement of the machine for operating on the box blanks, a combined stacking, straightening and delivering device in which a plurality of blanks are stacked from below and, periodically, a pile of blanks is removed from the top of the stack. By the time the stack is delivered from this device, they have been properly aligned mechanically through the use of a plurality of upwardly moving belts hereinafter described in more detail.

In accordance with the present invention, the box blanks as they are rapidly ejected from a folding and gluing or other processing machine are formed into a pile by an under feeding technique which provides sufficient pressure for those instances wherein it is desired to complete the gluing of the folded blanks. The blank stack as it forms by under feeding is continuously raised by means of upwardly moving belts which abut and apply a force to their leading and trailing edges.

When the straightened, folded blanks have risen above the upper end of the movable belts, they form an ever rising vertical stack which is being fed from beneath. A hold down device is provided to maintain the pressure on the stack and to ensure that the overlapped glued portions of each blank will be in intimate contact while the glue is setting. Thus in using the present device, the constant pressure on and alignment of the blank stack can often be used to correct a faulty folding operation wherein a blank may be folded so that the glued edges are not in alignment, and the subsequent box would not be formed to meet the required specifications.

In accordance with the present invention, a pusher or delivery device removes the top portion of the stack at predetermined intervals and delivers this portion to a conveyor or device which will perform a subsequent operation upon it. As the pusher engages the top portion of the stack, the remaining portion above the upwardly moving belts is held in place by suitable means which engage the leading edge of the stack. The stop means referred to above are adapted to be sufficiently rigid to hold the desired portion of the stack in place and at the same time are sufficiently flexible so that the bottom blank

of the portion of the stack being removed will not be damaged.

Accordingly, it is an object of the present invention to provide a combined blank stacking, straightening and delivery device which is rapid, accurate and minimizes the necessity for hand operations.

Another object of the present invention is to provide a stacking, straightening and delivery device which is readily synchronized with a machine which operates on such blanks and allows the ultimate issuance from the said machine of a stack having a predetermined number of properly aligned box blanks.

Still another object is to provide a straightening, stacking and delivery device including a plurality of upwardly movable belts for the straightening and accumulation of a stack of folded and glued box blanks.

A further object is to provide a yieldable stop and guide means.

A still further object of this invention is to provide a synchronized pusher device, both sides of which run on a double track to prevent tilting of the pusher.

Yet another object of this invention is to provide a hold-down means that will apply pressure from the top, across at least half of the stack at all times.

Still another object is to provide a straightening, stacking and delivery mechanism which may readily be adjusted to accommodate folded blanks of various sizes.

Another object is to provide a synchronized straightening, stacking and delivery mechanism wherein the speed of the delivery device may be adjusted independently of the speed of the mechanism.

These and other objects of my invention will become apparent from the following description taken in connection with the drawings, in which:

Figure 1 is a side elevation of the mechanism of the present invention showing how the blanks are received, straightened, stacked and delivered.

Figure 2 is an end view of the straightening, and the accumulating section of the present invention taken along the line 2—2 of Figure 1 looking in the direction of the arrows 2—2.

Figure 3 is a cross-section of the delivery section of the present invention taken along the line 3—3 of Figure 1 looking in the direction of arrows 3—3.

Figure 4 is a perspective view of the yieldable guide and stop means of the instant invention.

Figure 5 is a perspective view of another embodiment of a yieldable guide means.

Figure 6 is a perspective view of a folded and glued box blank having misaligned edges.

Figure 7 is a perspective view of the folded and glued box blank of Figure 6 after it has passed through the upwardly moving straightening belts.

The mechanism herein contemplated includes a conveyor operable in synchronization with the machine which has previously worked upon the box blanks, and a stacking and straightening device above the said conveyor comprising at least a pair of upwardly moving belts between which is accumulated a stack of the said blanks. The belts are adapted to engage the leading and trailing edges of the blanks and move upwardly in substantially parallel paths. The distance between the belts is readily adjustable, and in order to impart a lifting action to the stack and allow for efficient under-feeding, the belts are preferably spaced apart at a distance slightly less than the length of the blank.

Generally, it is preferred that the lifting belts travel upwardly at a slight angle to the vertical and that they be of a rubberized material having a high coefficient of friction so that the edges of the blanks engaged are easily gripped.

To accomplish this result it is desirable to use belts

having corrugations which would be transversed to the direction of motion of the belts and substantially horizontal with respect to the machine, i.e., substantially horizontal.

The edges gripped by the belts are the open edges of the blanks which are normal to the folded edges thereof.

The belts between which the stack is confined are open at the upper end and a longitudinally movable plate for periodically pushing a stack of said blanks from the upper end of the accumulating device is provided so that the lowermost edge of the pusher plate will clear the uppermost edge of the transverse plate abutting the front end of the stack of blanks. The blank pushing mechanism is also operated in synchronism with the conveying means. Flexible longitudinally extending hold-down bars are also provided so as to prevent dislocation of the top of the stack until delivery of the blanks therefrom.

It has been found that this mechanism may be adapted to accommodate folding machines which have a capacity of folding as many as 300 to 400 box blanks per minute.

Referring now to the drawings, driving power is supplied by variable speed drive 10, which is preferably an electric motor which also may drive the preceding mechanism such as a folding and gluing machine 17. The output of variable speed drive 10 is used to drive the conveyor 11, the delivery unit 12 and the accumulating device 13 in synchronism. However, the speed of the delivery unit 12 may be varied independently of the conveyor speed by means of gear box 14 in order to adjust the number of folded blanks 100 to be removed with each stroke of pusher 15. In a similar manner, the speed of the accumulating device 13 may be varied independently of the speed of conveyor 11 by means of gear box 16 in order to accommodate straightened folded blanks 100 of varying thicknesses.

Sprocket wheel 21, riding on shaft 20 of variable speed drive 10, is connected through chain 30 to appropriate gearing mechanism 23-27 which is provided to convey the unstraightened folded blank 99 forward in the space 29 below continuous movable belt 40, which is positioned vertically, and thereby causes stack 31 to be added to from below. The conveyor 11 is driven by sprocket wheel 32 operatively connected to variable speed drive 10 by means of chain 33. Belt 34 rides on sprocket wheel 32 and further rides on idlers 34-38 as well as idler 39 which is part of tension adjustment 41. Belt 34' is sloped at 35' thereof so as to permit the entry of blanks 99 to the stack 31 from beneath.

A manual height adjustment of the entry space 29 is accomplished by wheel 50 which is secured to the frame of the mechanism at 60 and by adjustment of threaded member 51 which is supported by rigid frame extension 61. The size of entry space 29 is varied in accordance with the thickness of the blanks 99 being received from the prior mechanism 17.

In order to adjust the accumulating device 13 for the length of blank 99 being received from the preceding mechanism 17, hand wheel 63 is provided to control the longitudinal position of movable frame member 57 on which continuous movable belt 140 is supported. Hand wheel 63 drives chain 64 which in turn drives members 65 which are rotatably mounted on frame 60. Idlers 67 are positioned to insure good driving engagement between chain 64 and members 65. Members 65 are internally threaded to receive threaded shafts 66 which are secured to movable frame member 57 at 68.

Chain 65 is connected between gear box 14 and sprocket wheel 24 to provide the operative connection between variable speed drive 10 and delivery unit 12. Driver member 72 is engaged by chain 65 and through a series of gears, illustrated as 73, is made to engage and drive one of a plurality of gears 74a, b, c or d. This mechanism is encased in gear box 14 and is illustrative of one well-known common variable speed mechanism.

Gear members 74a-74d are secured to shaft wheels 77a and 77b which extend from opposite sides of gear box 14. The take-off mechanism 12 is symmetrical about the center line of Figure 3 with the left side being driven by shaft wheel 77a and the right side being driven at the same speed by shaft wheel 77b. Since the mechanism to the left and right of the center line of Figure 3 is symmetrical, only the right side will be described, it being understood that the left side is the mirror image thereof.

Shaft wheel 77b drives chains 79 and 80 which in turn drive sprocket wheels 81 and 82 respectively. Sprocket wheel 81 is mounted on shaft 85 affixed to frame 60, which is common to sprocket wheel 83 so that sprocket wheels 81 and 83 rotate in unison. Similarly, sprocket wheels 82 and 84 being mounted on common shaft 86 will rotate in unison. Continuous chain 87 passes over sprocket wheels 83 and 89 and is driven by the former in response to the rotation of gear member 74. Similarly, chain 88 passes over sprocket wheels 84 and 90 to be driven by the former.

Chains 87 and 88 carry bushing members 91 and 92 respectively. Shafts 93 and 94 are secured to bushing members 91 and 92 respectively by set screws 95 and 96. Support plate 97 is pivotally mounted to both shafts 93 and 94 to insure that support plate 97 remains vertical throughout its path of travel, and particularly when pusher plate 15 engages the stack 31. Support plate 97 is secured at two upper and two lower points to prevent any lateral tilting thereof as well as to prevent longitudinal tilting thereof.

Pusher plate 15 is secured to support plate 97 by means of wheels 181a, b, c, d which are adapted to ride on the edges 182 and 183 of support plate 97. Ears 184 and 185 at the bottom of support plate 97 serve to limit the downward movement of pusher plate 15.

Pusher plate 15 operates in synchronization with the stacking straightening device 13 in order to periodically deliver a predetermined number of blanks. As pusher plate 15 moves forward to remove the top portion 31a of stack 31, the stack is continuously rising so that the top of the bottom portion 31b of the stack 31 engages the bottom 180 of pusher plate 15 forcing it to slide upward on rollers 181a, b, c, d.

The stacking and straightening section or accumulating device 13 comprises continuous movable belts 40, 140 oriented vertically or transversely with respect to conveyor 11. Movable belts 40, 140 receive their driving power from wheels 120 and 121, respectively. Wheel 120 is mounted on shaft 122 which also mounts wheel 123, while wheel 121 is mounted on shaft 124 which also mounts wheel 125. Chain or belt 126 passing around or over driver 127 and idlers 128a-g engages wheels 123 and 125 to drive continuous movable belts 40 and 140 whose lower ends are guided by wheels 12a and 121a, respectively. Driver 127 is operatively connected to variable speed drive 10 through gear box 16 which is of a similar design to gear box 14. Chain 230 interconnects variable speed drive 10 and gear box 16 while chain 231 interconnects gear box 16 and driver 127.

When a folded and glued blank 99 is transported forward by conveyor 11 it first rides on incline 35' so as to pass through space 29 between vertical belt 40 and the incline 35'. As the blank 99 is further moved by the conveyor 11, of its own weight the blank 99 will pivot at the top 35a of incline 35' so as to lie substantially horizontal. The trailing edge 99b is engaged by the ridges 41 of belt 40 to provide an initial lift to blank 99 and thereby provide easy access for the following blank. Belt 40, rather than having ridges 41 thereon, may be constructed of a material having a high coefficient of friction. At the same time the leading edge 99a is engaged by belt 140.

The blank 99 is now being gently squeezed between belts 40 and 140 so that the unfolded edges become

5

aligned to form folded blank 100 which is blank 99 with its edges and score lines in alignment. Gradual squeezing is applied all during the time that the blanks 99 are engaged by the working surfaces 40a and 140a, which are the parallel faces of belts 40 and 140, so as to give the glue time for partial setting. At this same time the speed of belts 40 and 140 may be adjusted so that blanks 99 are not required to support the weight of the blanks above since the blanks 99 are now slightly spaced in substantially parallel relationship. Support members 42 and 142 are provided behind the working surfaces 40a and 140a to prevent sagging thereof. The forward inclination of working surface 140a relieves some of the stresses on leading edge 99a caused by its engagement with movable belt 140.

Stack 31 is increasing in height by being fed from beneath until such time as the pusher plate 15 removes the top portion 31a thereof. Before pusher plate 15 engages stack 31, hold down strips 190 and 191 are resting on the top of stack 31 to apply a downward pressure thereto so that the glued areas will remain in engagement. As the top 31a is being removed from the stack 31, the shorter strip 191 falls free of the top portion 31a and rests on bottom portion 31b thus insuring a continuous application of force to the top of the stack.

Strips 190 and 191 are preferably flexible members, each rigidly secured at one end 192 and 193 respectively to frame 60 by means of set screws 194 and 195 which are slidable in frame 60 so as to permit adjustment of the spacing strips relative to each other and relative to the top end of vertical belts 40 and 140 in accordance with the number of blanks to be removed with each stroke of pusher plate 15.

A front guide means 200 is positioned at the leading edge of stack 31 adjacent to the top of front stepped member 291. Front guide means 200 engages the leading edge of the bottom portion 31b of stack 31 to prevent forward movement thereof when top portion 31a is engaged by pusher plate 15 and moved forward off of the stack.

Front guide means 200 (Figure 4) comprises resilient members 201-203 that are rigidly mounted in stepped relationship to movable frame member 57 by means of rivets (not shown). If the leading edge of bottom most blank 100 engaged by the pusher plate 15 is not at a height greater than the top edge 205 of guide means 200, one or more of the resilient members 201-203 will flex and permit this blank 100 to move forward without injury thereto. After this bottom blank 100 has risen above top edge 205 and has been driven off of stack 31, the resilient members 201-203 will return to their substantially vertical, at rest positions.

An alternate front guide means 300, illustrated in Figure 5, comprises rigid members 301-303 pivotally mounted on shaft 304. Each member 301-303 is associated with a torsion spring 305-307 respectively. One end of each spring 305-307 is anchored to shaft 304 while the other end bears against its associated member 301-303 to bias it counterclockwise to the vertical position illustrated. When one or more members 301-303 are engaged by the leading edge of a blank 100 the member 301-303 is caused to rotate clockwise thus loading its associated spring 305-307. When this blank 100 finally clears the members 301-303 the loaded springs 305-307 will return members 301-303 to the vertical position. Members 301-303 are illustrated as being positioned side by side in stepped relationship. However, since members 301-303 are not positioned one behind the other, any side by side order is satisfactory.

Aligned slots 210 and 211 in pusher plate 15 and support plate 97 respectively permit these members to pass over the accumulating section 13 without engaging hold-down strips 190, 191 or front guide means 200.

Although this invention has been described with respect to its preferred embodiments it should be under-

6

stood that many variations and modifications will now be obvious to those skilled in the art, and it is preferred, therefore, that the scope of this invention be limited not by the specific disclosure herein but only by the appended claims.

What is claimed is:

1. A stacking and straightening mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second belt means each having upwardly moving working surfaces, for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and second belt means being spaced along said horizontal path; at least the more forwardly positioned of the working surfaces being upwardly and forwardly inclined; the distance between the engaging surfaces of said belts being slightly less than the length of the blank engageable therebetween; and said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough.

2. The stacking and straightening mechanism as set forth in claim 1 in which the first and second belt means are positionable with respect to each other so as to vary the spacing therebetween.

3. The stacking and straightening mechanism as set forth in claim 1 in which the second belt means includes a plurality of spaced ridges formed integrally thereon and positioned transverse to the direction of travel of the said belt for providing a lifting action to the trailing edges of the stacked blanks.

4. A stacking, straightening, and delivery mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; each of said belt means having upwardly moving working surfaces with at least the most forwardly positioned of said working surfaces being upwardly and forwardly inclined; and a longitudinally movable pusher plate operatively positioned above said accumulating device for periodically engaging and pushing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device; said pusher plate being operable in synchronism with said machine.

5. A stacking, straightening, and delivery mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively

7

of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; each of said belt means having upwardly moving working surfaces with at least the most forwardly positioned of said working surfaces being upwardly and forwardly inclined; a longitudinally movable pusher plate operatively positioned above said accumulating device for periodically engaging and pushing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device said pusher plate being operable in synchronism with said machine and means for supporting said plate so that it remains in a substantially vertical position during its entire contact with said stack.

6. The stacking, straightening, and delivery mechanism as set forth in claim 5 including means for providing said pusher plate with an oscillatory longitudinal motion synchronized with the said mechanism whereby said plate moves forwardly in a lower position and rearwardly in an upper position.

7. A stacking, straightening, and delivery mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; a longitudinally movable pusher plate operatively positioned above said accumulating device for periodically engaging and pushing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device said pusher plate being operable in synchronism with said machine and means for supporting said plate so that it remains in a substantially vertical position during its entire contact with said stack; and hold-down means operatively positioned to engage the top of said stack and thereby apply a downward force to the stack at all times; said hold-down means including a member in engagement with the top portion of the stack after said top portion has been moved forwardly of said bottom portion.

8. A stacking, straightening, and delivery mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; each of said belt means having upwardly mov-

8

ing working surfaces with at least the most forwardly positioned of said working surfaces being upwardly and forwardly inclined; a longitudinally movable pusher plate operatively positioned above said accumulating device for periodically engaging and pushing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device said pusher plate being operable in synchronism with said machine and means for supporting said plate so that it remains in a substantially vertical position during its entire contact with said stack; and guide means operatively positioned at the leading edge of said stack to prevent forward movement of said bottom portion during the interval of time that said plate is pushing said top portion.

9. The stacking, straightening and delivery mechanism as set forth in claim 8 in which the guide means comprises a plurality of leaf-spring like members so as to be sufficiently rigid to hold the desired portion of the stack in place and at the same time are sufficiently flexible so that the bottom blank of the portion of the stack being removed will not be damaged.

10. A stacking, straightening, and delivery mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; a longitudinally movable pusher plate operatively positioned above said accumulating device for periodically engaging and pushing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device said pusher plate being operable in synchronism with said machine and means for supporting said plate so that it remains in a substantially vertical position during its entire contact with said stack; and hold-down means operatively positioned to engage the top of said stack and thereby apply a downward force to the stack at all times; said hold-down means including a member in engagement with the top portion of the stack after said top portion has been moved forwardly of said bottom portion and guide means operatively positioned at the leading edge of said stack to prevent forward movement of said bottom portion during the interval of time that said plate is pushing said top portion.

11. A stacking, straightening, and delivery mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; a longitudinally movable pusher plate oper-

actively positioned above said accumulating device for periodically engaging and pushing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device said pusher plate being operable in synchronism with said machine and means for supporting said plate so that it remains in a substantially vertical position during its entire contact with said stack; a first variable speed drive means operatively connected to said conveyor; a second variable speed drive means operatively connected to said plate to enable the speed thereof to be varied independently of the speed of said conveyor to thereby vary the number of blanks included in said top portion; said first and second variable speed drive means being synchronously and operatively connected.

12. A stacking and straightening mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; said conveyor also having a second portion positioned forward of said first portion which is disposed substantially parallel to the horizontal; means operatively positioned above said first and said second belt means for periodically removing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device; yieldable guide means operatively positioned at the leading edge of said stack to prevent forward movement of said bottom portion during the interval of time that said pusher means is in engagement with said top portion.

13. A stacking and straightening mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second substantially parallel upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the distance between the engaging surfaces of said belts being slightly less

than the length of the blank engageable therebetween; and said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; said blank engaging belts both having upwardly moving working surfaces forwardly inclined with respect to said conveyor.

14. A stacking, straightening and delivery mechanism adapted for use with a machine for operating on box blanks, said mechanism comprising a conveyor operable in synchronism with said machine to receive blanks issuing therefrom and move said blanks in a flat position in a first or longitudinal direction along a horizontal path; an intercepting and accumulating device operatively positioned above said conveyor, said device including first and second upwardly movable belt means for engaging therebetween the leading and trailing edges respectively of the blanks accumulated between said belts and move said blanks upwardly in said flat position to form a stack; said first and said second belt means being spaced along said horizontal path; the lowermost portion of said second belt means being operatively positioned above said conveyor so as to provide an opening under said second belt means for the entry of successive blanks therethrough; a longitudinally movable pusher plate operatively positioned above said accumulating device for periodically engaging and pushing a top portion of said stack from said accumulating device and leaving a bottom portion of said stack in said accumulating device; said pusher plate being operable in synchronism with said machine; and means for supporting said plate so that it remains in a substantially vertical position during its entire contact with said stack; and hold-down means operatively positioned to engage the top of said stack and thereby apply a downward force to the stack at all times; said hold-down means comprising strips of unequal lengths.

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