Oct. 14, 1969 A. E. CRANSTON, JR., ET AL 3,471,994

WRAPPER DISPENSER

Filed Aug. 8, 1966 4 Sheets-Sheet 1

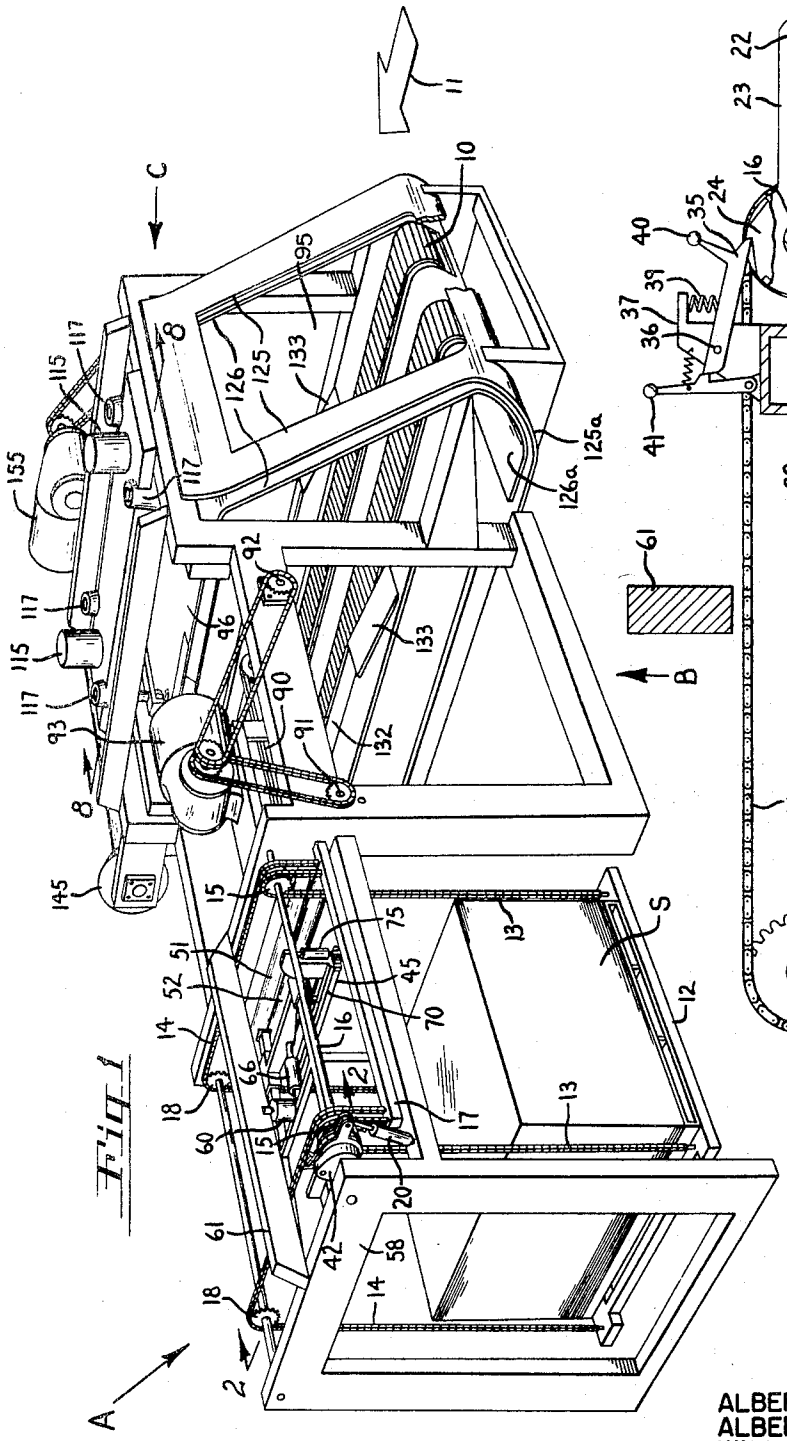

Fig. 1

Fig. 2

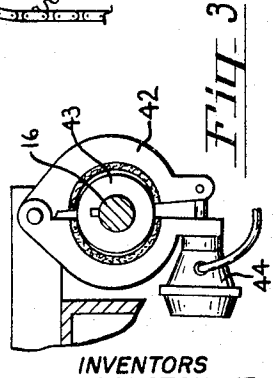

Fig. 3

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WRAPPER DISPENSER

Filed Aug. 8, 1966 4 Sheets-Sheet 2

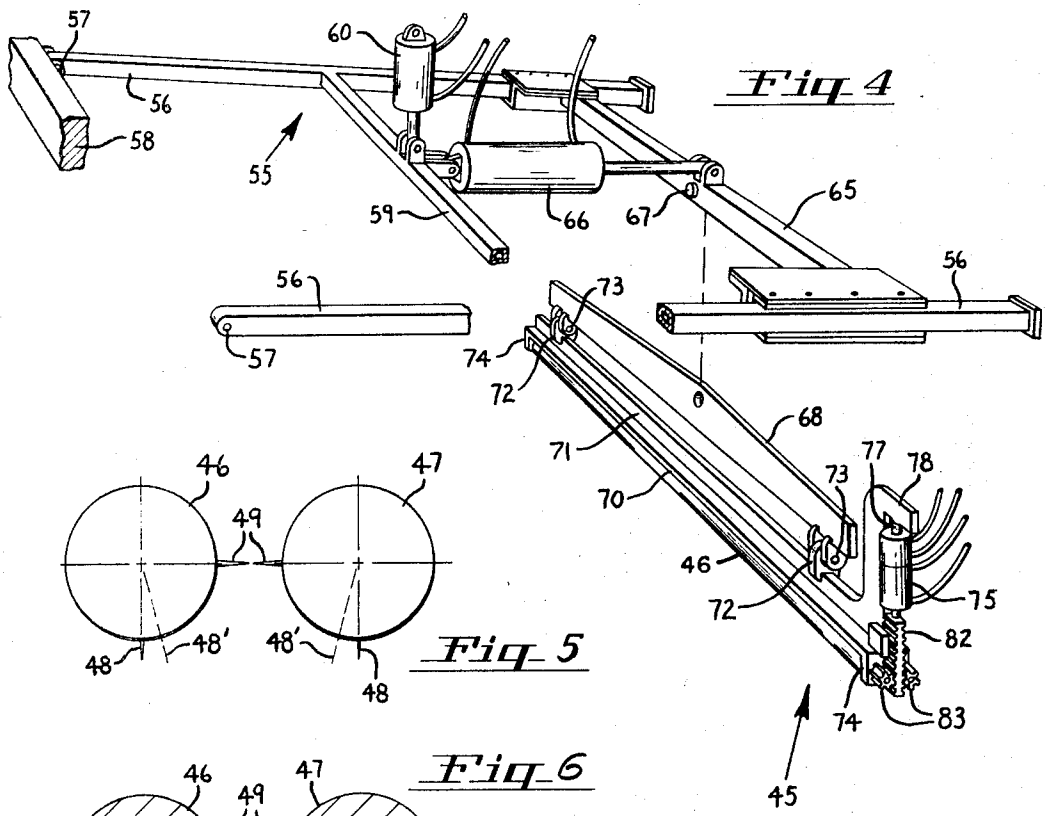
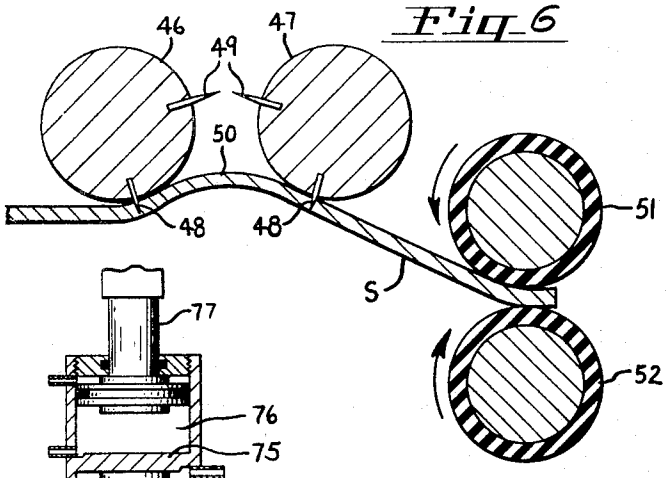


Fig 4

Fig 5

Fig 6



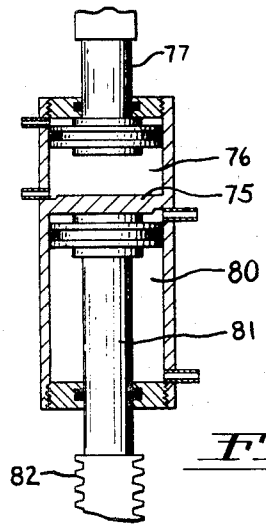


Fig 7

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WRAPPER DISPENSER

Filed Aug. 8, 1966 4 Sheets-Sheet 3

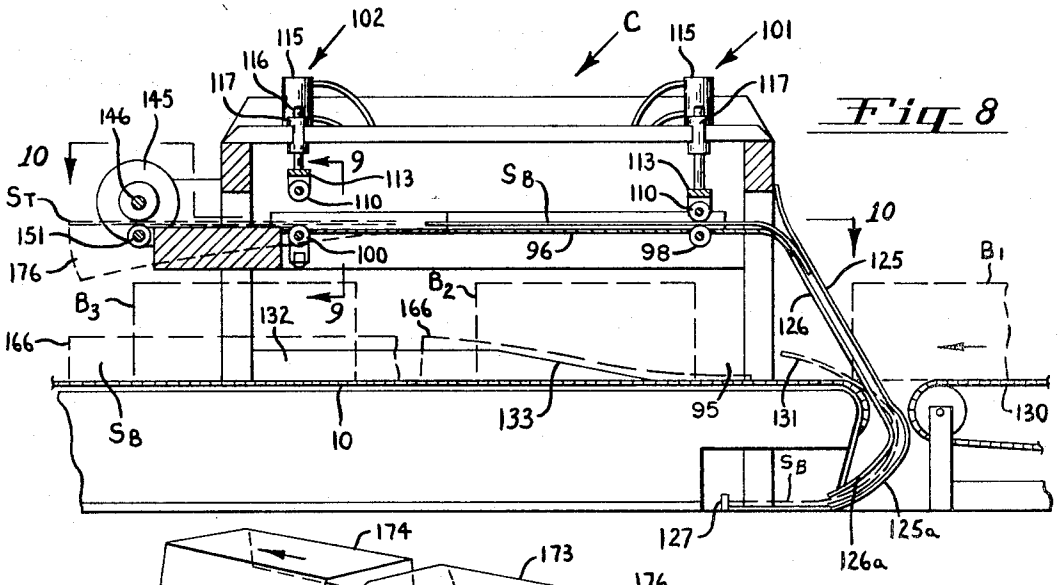

Fig. 8

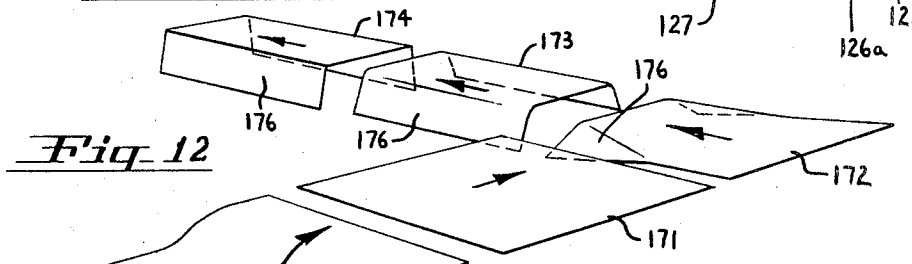

Fig. 12

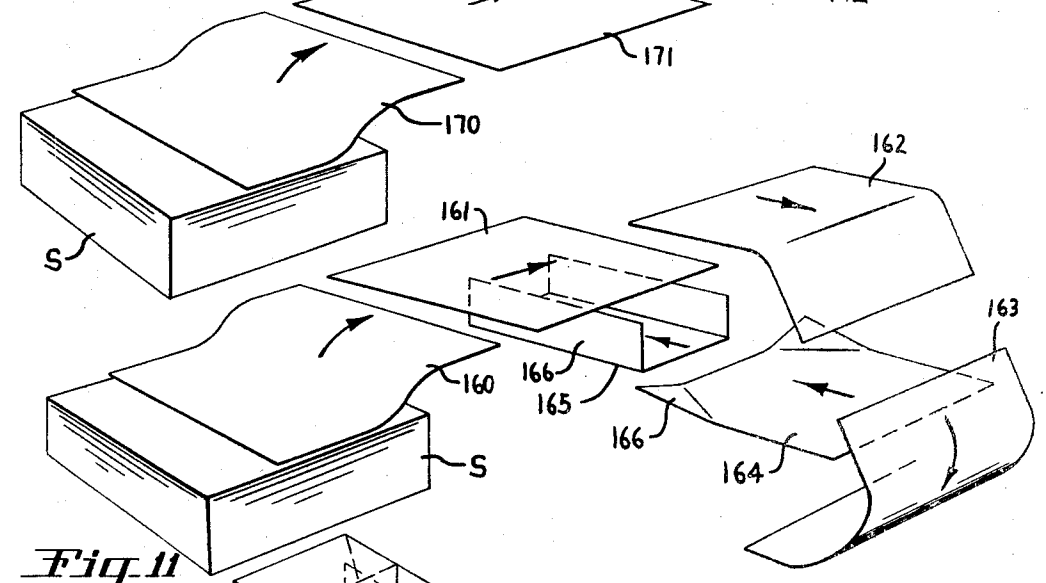

Fig. 11

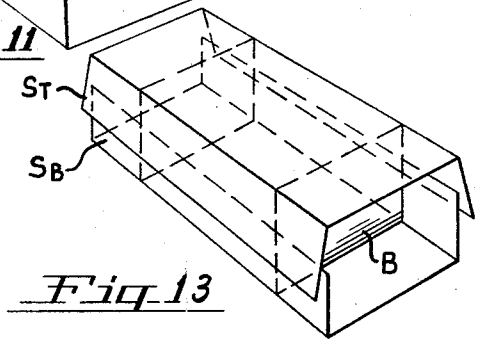

Fig. 13

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WRAPPER DISPENSER

Filed Aug. 8, 1966 4 Sheets-Sheet 4

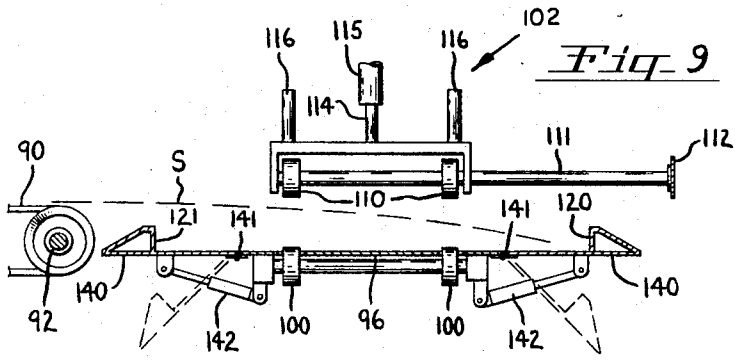

Fig. 9

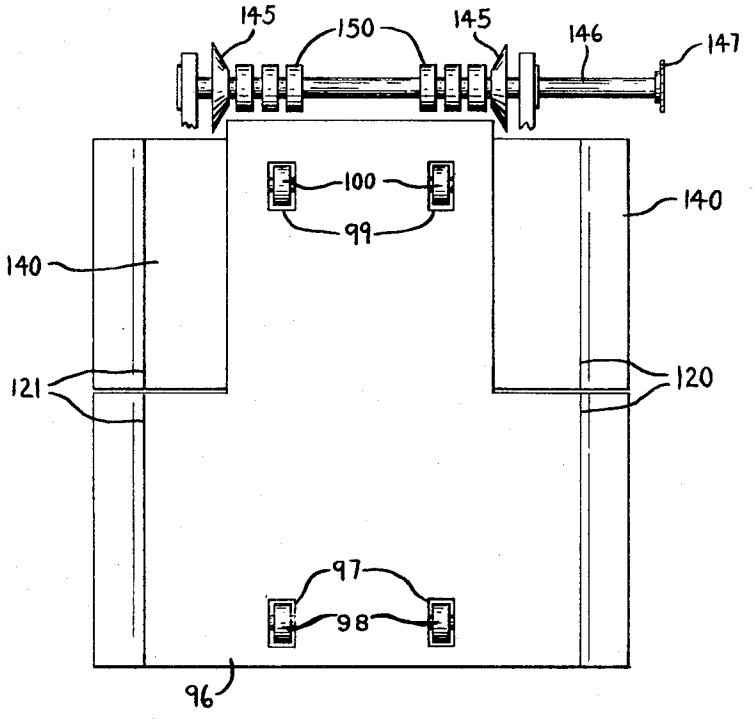

Fig. 10

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United States Patent Office

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WRAPPER DISPENSER

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Int. Cl. B65b 11/50, 11/08, 41/10
U.S. Cl. 53—209 13 Claims

ABSTRACT OF THE DISCLOSURE

Wrappers are removed from a stack and fed to a dispensing tray above a bundle passageway. Bottom wrappers are fed forward from the tray and disposed in curtain position across the entrance to the bundle passageway so that oncoming bundles bend the wrappers down and override them carrying these wrappers along under the bundles. Top wrappers are fed rearward from the tray and deposited on top of bundles leaving the bundle passageway. Side portions of the wrappers are folded against opposite sides of the bundles.

This invention relates to a machine for applying top and bottom wrapper sheets to bundles to be wrapped and bound. This machine performs certain functions which are preliminary to the final folding of the wrappers and the securing of the wrappers by a binding or strapping machine.

The general object of the invention is to provide apparatus for quickly and efficiently applying top and bottom wrappers to bundles. More specific objects are to provide a novel and improved apparatus for the purpose described which is adapted for fully automatic operation, to provide a wrapper dispenser which will apply top and bottom wrappers in such condition that they may subsequently be folded about the bundle by an automatic folding machine, to provide a wrapper dispenser which will operate on moving bundles on the fly without stopping the bundles, and to provide novel mechanism for picking up precut wrapper sheets from a stack of wrappers either one or two at a time as may be desired.

The present machine is not limited to any specific size or character of bundle but is of particular advantage in connection with the wrapping of large bales of compressed wood pulp with heavy paper or other suitable wrapping material. The average size of such bales is 27 inches by 30 inches by 16 inches. The machine is adapted to apply wrappers to such bundles in a fifteen second cycle of operation which permits a rate of flow of up to 240 bundles per hour.

The machine is flexible in operation. It is readily adjustable to accommodate bundles of different sizes as specified. Either single top and bottom wrappers may be applied, double top and bottom wrappers or double bottom wrappers and single top wrappers. This selectivity is provided by a novel wrapper pickup mechanism which feeds pre-cut wrapper sheets into the dispensing section of the machine. The dispenser may also be supplied from rolls of paper stock cut to size and fed into the machine.

Another unique feature of the machine is the feeding of both top and bottom wrappers from a position above a bundle passageway through which the bundles travel in continuous movement without stopping. Side portions of both top and bottom wrappers are folded against the sides of the bundle in overlapping relationship whereby the bundle may be moved ino a binding machine to apply a transverse binding or strapping which holds the wrappers in place. Subsequent operations by a folding machine folds the ends of the wrappers and applies a longitudinal

binding to complete the wrapping and binding of the bundle. The present invention is concerned only with the application of the top and bottom wrappers to the bundle and the folding of these wrappers against the sides of the bundle in preparation for the first binding operation mentioned above.

The invention will be better understood and additional objects and advantages will become apparent from the following description of the preferred embodiment illustrated in the accompanying drawings. Various changes may be made, however, in the details of construction and arrangement of parts and certain features may be used without others. All such modifications within the scope of the appended claims are included in the invention.

In the drawings:

FIGURE 1 is a perspective view of a machine embodying the principles of the invention;

FIGURE 2 is an enlarged fragmentary view on the line 2—2 in FIGURE 1;

FIGURE 3 is a fragmentary view showing the brake on the wrapper stack elevator mechanism;

FIGURE 4 is a fragmentary exploded perspective view showing the wrapper pickup mechanism;

FIGURE 5 is a diagrammatic view showing the action of the needle bar pickup mechanism;

FIGURE 6 is a fragmentary sectional view further showing the action of the wrapper pickup and initial feeding mechanism;

FIGURE 7 is an enlarged sectional view of the needle selection and pinch cylinder in FIGURE 4;

FIGURE 8 is a view on the line 8—8 in FIGURE 1;

FIGURE 9 is a view on the line 9—9 in FIGURE 8;

FIGURE 10 is a view approximately on the line 10—10 in FIGURE 8;

FIGURE 11 is a schematic view showing the bottom wrapper feeding, dispensing and folding action;

FIGURE 12 is a schematic view showing the top wrapper feeding, dispensing and folding action; and

FIGURE 13 is a perspective view showing a bundle with wrappers applied thereto.

The machine illustrated in FIGURE 1 comprises, generally, three main sections A, B and C. Section A contains a sheet pickup mechanism, section B is a transfer section and section C contains the dispensing mechanism. Section A holds a stack of pre-cut wrapper sheets S and section C contains a bundle conveyor **10** for moving bundles through the machine in the direction of arrow **11**.

The stack of sheets S is supported on elevator platform **12** which is suspended by a pair of front chains **13** and a pair of rear chains **14**. These chains are trained over pairs of sprocket wheels **15** on a drive shaft **16** and have their ends connected with a counterweight bar **17**. Rear chains **14** are also trained over idler sprockets **18**. A double acting pneumatic cylinder **20** is provided for rotating shaft **16** in step by step movement to raise elevator platform **12** from time to time as sheets are removed from the stack.

As shown in FIGURE 2, cylinder **20** contains a piston rod **21** which is pivotally connected at **22** with the end of an arm **23**. Arm **23** is mounted for free rotation on shaft **16** alongside a ratchet wheel **24** which is keyed to the shaft. A lifting pawl **25** is pivotally mounted at **26** on a part of arm **23** and urged against the ratchet wheel by a compression spring **27**. The lifting pawl may be manually disengaged from the ratchet wheel by a release handle **28** and held in disengaged position by a latch lever **30**.

A holding pawl **35** is pivotally mounted at **36** on an upstanding bracket **37**. This bracket is mounted on a supporting member **38** on the frame of section A. This pawl is normally pressed into engagement with ratchet

wheel 24 by a compression spring 39 but the pawl may be disengaged by a release handle 40 and held in disengaged position by a latch lever 41. When both pawls 25 and 35 are in normal operating positions as shown, reciprocation of piston rod 21 will rotate the shaft 16 clockwise to raise the elevator platform 12. Counterweight bar 17 keeps the chains tensioned sufficiently to mesh with the sprocket wheels.

As shown in FIGURE 3, a brake 42 has a pair of arcuate shoes arranged to engage a brake drum 43 keyed on one end of shaft 16. The brake is normally spring released as shown and is actuated to clamp the brake drum by a pneumatic diaphragm unit 44. When the platform 12 is to be lowered to replenish the supply of wrapper sheets or for any other reason, air pressure is first supplied to diaphragm unit 44 to engage the brake and prevent rotation of shaft 16. Then pawls 25 and 35 are retracted away from ratchet wheel 24 and held in retracted positions by their respective latch members 30 and 41. By relieving some of the air pressure in diaphragm unit 44 by a manual valve, the brake is released sufficiently to permit elevator platform 12 to descend gently by gravity to its lowermost position. Then the air pressure is entirely relieved and latches 30 and 41 are released.

After a new supply of wrapper sheets has been placed on the elevator platform, the platform is raised by operation of cylinder 20 until the top of the stack is within reach of a sheet pickup mechanism presently to be described. As sheets are removed from the top of the stack, the elevator lift cylinder 20 is operated from time to time to keep the top of the stack close to a predetermined level. Conventional levelling mechanism, not shown, is provided, as will be understood by persons skilled in the art, for actuating a valve to operate cylinder 20 and reciprocate the piston rod 21 whenever the top of the stack of sheets falls below the predetermined level.

A sheet pickup mechanism 45 is mounted in the top of section A above the stack of sheets S. The details of this mechanism are shown in FIGURES 4 to 7. This mechanism comprises, essentially, a pair of parallel, closely spaced needle bars in the form of rolls 46 and 47, each equipped with a row of short needles 48 and a row of long needles 49. The rolls extend transversely of the direction of sheet feed from the stack and are movable up and down and in the direction of sheet feed, which is to the right in FIGURES 1, 4, 5 and 6. Short needles 48 protrude from the rolls a distance equal to the thickness of a single sheet of wrapper paper while long needles 49 protrude from the rolls a distance equal to the combined thickness of two sheets of wrapper paper. When single sheets of wrapper paper are being dispensed, the short needles 48 normally point straight down as shown in FIGURE 5 and when double sheets are to be dispensed, the rolls are rotated so that the long needles 49 will point straight down.

FIGURES 5 and 6 illustrate the pinching action by which either single or double sheets are lifted from the top of the stack of sheets S. When the rolls 46 and 47 are pressed against the top of the stack of sheets in the position shown in FIGURE 5, the short needles 48 will pierce only the top sheet. Then the under sides of the rolls are rotated toward each other about 15° as indicated by the broken lines 48' in FIGURE 5, causing the needles 48 to pinch and gather a portion of the sheet near one edge into an arch between the rolls as indicated at 50 in FIGURE 6. With the needles in this position, the rolls 46 and 47 are lifted, carrying the top sheet up with them.

With the top one or two sheets thus removed from the stack, the rolls 46 and 47 are then moved to the right to carry the adjacent edge of the sheet between a pair of rotating feed rolls 51 and 52. When the sheet is put in traction by the feed rolls it is pulled off the needles and continues to feed between rolls 51 and 52. The mechanism for operating the rolls 46 and 47 will now be described.

A guide frame 55 has a pair of parallel side rails 56 extending parallel with shaft 16. The ends of these rails are pivotally connected at 57 with brackets on a top frame member 58 of section A. Frame 55 further includes a cross member 59 interconnecting the rails 56. The frame 55 may be raised or lowered on its pivotal connections at 57 by means of double acting pneumatic cylinder and piston unit 60 which is connected between the cross member 59 and a top beam 61 in the frame of section A.

A bar 65 is slidably mounted on the vertically movable ends of rails 56. Bar 65 may be moved back and forth along the rails by a double acting pneumatic cylinder and piston unit 66 connected between the bar 65 and cross member 59. A bar 68 is connected with bar 65 by a horizontal center pivot 67. Bar 68 carries the needle bar assembly 70.

Needle bar assembly 70 comprises an inverted T bar 71 having a pair of upstanding apertured ears 72 adjacent its opposite ends. Ears 72 are pivotally connected by means of pins 73 with similar apertured ears on the under side of bar 68. T bar 71 has downturned ends 74 provided with bearings to support the rolls 46 and 47 in side by side relation. Pivots 67 and 73 provide universal movement so that when frame 55 is lowered by cylinder 60, the two rolls 46 and 47 will adjust themselves to the top of the stack of sheets S with both rolls bearing throughout their length on the top sheet, causing all the downturned needles to pierce the sheet.

It will be observed that needle bar rolls 46 and 47 require two types of rotation. A 15° to 25° rotation is necessary in each cycle to pick up the sheets, depending on the sheet thickness, and a 90° rotation is necessary only in changing from a short needle pickup to a long needle pickup and vice versa. These two types of rotation are accomplished by a double cylinder 75. Cylinder 75 has an upper chamber 76 containing a pinch piston and piston rod 77 connected with an offset end 78 on T bar 71. The lower end of cylinder 75 has a second chamber 80 containing a needle selection piston and piston rod 81 connected with a double rack bar 82. Teeth on the opposite sides of rack bar 82 mesh with a pair of gears 83 on one end of the two rolls 46 and 47.

Lower piston 81, which has a long stroke, rotates the rolls 46 and 47 through 90° to selectively place either the short needles 48 or the long needles 49 in operative position while the upper piston 77, which has a short stroke, rotates the selected needles toward each other through the 15° angles shown in FIGURE 5 for grasping the top sheet or sheets. The grasped sheet is lifted by cylinder 60 and its right edge is fed into feed rolls 51, 52 by cylinder 66. These cylinders then return the needle bar assembly to a rest position in preparation for picking up another sheet. It will be observed in FIGURE 6 that the needle bar assembly is engaged with the stack of wrapper sheets near the right edge which is to be introduced between feed rolls 51, 52. Only this portion of each sheet is lifted by the needle bar assembly. When the lifted edge is tensioned by the feed rolls, the sheet swings the needle bar assembly 70 toward the feed rolls on pivotal supports 73 allowing the sheet to be pulled off the needles without tearing the sheet.

The sheets may be picked up by the needles in various ways. Instead of rotating toward each other to pinch and gather a portion of the sheet, the two rows of needles may be rotated away from each other to tension the sheet. Instead of lowering the needles vertically into the sheet and then rotating them to grasp the sheet, the needles may first be rotated to positions where they will not engage the sheet when the rolls 46, 47 are lowered on the sheet. Then the needles are rotated into piercing and grasping positions. The needles do not have to be radial to the

rolls 46 and 47. Such variations in the grasping action are governed by the thickness and other characteristics of the wrapper sheets.

Feed rolls 51 and 52 deliver the sheets laterally onto horizontal conveyor belts 90 in transfer section B as seen in FIGURE 1. Feed rolls 51 and 52 are driven by a shaft 91 and the conveyor belts 90 are driven by a shaft 92. Both of these shafts are driven continuously by a motor 93. Belts 90 deliver the sheets laterally in horizontal position to a holding and dispensing station above bundle passageway 95 in dispensing section C.

This dispensing station comprises the horizontal tray 96 shown in FIGURES 8, 9 and 10. The forward end of tray 96 is provided with a pair of openings 97 through which the upper sides of a pair of idle rollers 98 protrude and the rear end of the tray is provided with a pair of openings 99 through which the upper sides of a pair of idle rollers 100 protrude. The rollers 98 cooperate with a bottom sheet feeder 101 and the rollers 100 cooperate with a top sheet feeder 102 as shown in FIGURE 8.

The bottom and top sheet feeders 101 and 102 are of identical construction as shown in FIGURE 9. Directly above the bottom rollers 100 is a pair of top rollers 110 keyed to a shaft 111 which is driven by a sprocket wheel 112. Shaft 111 is mounted for rotation in bearings in a transverse frame 113 which may be raised and lowered by a piston rod 114 in a vertical cylinder 115. The frame is guided for vertical movement by a pair of upstanding guide rods 116 which slide in vertical bushings 117 in the top frame of section C. Corresponding parts of the bottom sheet feeder 101 bear similar reference numerals in FIGURE 8. The rollers 110 of feed unit 101 rotate counterclockwise to feed a sheet lonigtudinally to the right in FIGURE 8 while the rollers 110 in feed unit 102 rotate clockwise to feed a sheet longitudinally to the left. When a sheet S is delivered onto the tray 96 by belts 90 as shown in FIGURE 9, both feeders 101 and 102 are in raised position and the sheet is supported in stationary position by the tray.

The incoming sheet S in FIGURE 9 is located in proper position on tray 96 by a pair of longitudinally extending stop fences 120 and 121. The incoming sheet impinges against stop fence 120 and the sheet is retained between the two stop fences which are spaced apart a distance slightly exceeding the width of the sheet.

Actuation of bottom sheet feeder 101 causes the sheet then on tray 96 to be fed to the right in FIGURE 8 between forwardly extending inclined upper and lower guides 125 and 126 on opposite sides of the bundle passageway 95 in FIGURE 1. These guides have rearwardly turned lower end portions 125*a* and 126*a* below the level of bundle conveyor 10. The sheet follows the guides around this bend and its movement is arrested when the lower end of the sheet encounters stop 127. The upper end of the sheet then projects a short distance above bundle conveyor 10 disposed in the path of an approaching bundle arriving on an infeed conveyor 130. The paper is of sufficient stiffness that it will be adequately supported by its side edges as it slides down the guides 125 and 126 and when it comes to rest, forming a curtain without falling into the bundle passageway.

When a bundle approaches in the B_1 position shown in FIGURE 8, the leading bottom corner of the bundle passes through the bundle passageway opening in guides 125 and 126 and strips the upstanding upper end of the sheet out of the guides as indicated at 131. A portion of the sheet is thereby clamped between the bottom of the bundle and conveyor 10 so that the sheet is caused to move along with the bundle and conveyor. Stop 127 is adjusted so that this encounter of the bundle with the sheet will place the bundle equidistant from the opposite ends of the sheet. As the bundle travels forward on conveyor 10, the lower portion of the sheet is pulled up out of arcuate portions 125*a* and 126*a* of the guides until the whole sheet is disposed on conveyor 10 underneath the bundle.

As will as being longer than the bundle, the wrapper sheets are also wider than the bundle. Folding plates 132 in FIGURES 1 and 8 have inclined wings 133 which fold up side portions of the bottom sheet against opposite sides of the bundle as the bundle travels between these plates. This position of the bundle is indicated at B_2 in FIGURE 8. As the bundle passes beyond the wings 133, up-folding of the side portions of the bottom wrapper sheet is completed and the bundle is ready to receive its top wrapper sheet.

As soon as a bottom wrapper sheet has been dispensed from tray 96 in the manner just described, the pickup mechanism in section A feeds another wrapper sheet through transfer section B to the tray 96. This sheet is laid on top of the bundle by feeder 102 as the bundle emerges from under the tray. Opposite side portions of the top wrapper which project beyond the sides of the bundle must be folded down to overlap the upturned side edges of the bottom wrapper. To facilitate such down folding, the rear end of tray 96 is provided with a pair of pivoted panels 140 mounted on hinges 141.

As a top wrapper sheet is being laid on top of the bundle, both of the panels 140 are lowered to inclined position as shown in broken lines in FIGURE 9 by the action of pneumatic cylinders 142. With support of the overhanging side portions of the sheet thus removed, these portions start to droop in preparation for the down fold operation. When the top wrapper sheet has been discharged from the tray 96, the panels 140 are raised to receive a new sheet. The distance between hinges 141 is equal to the width of the narrowest bundle to be wrapped.

Down folding of the top wrapper sheet is accomplished by a pair of conical rollers 145 on a shaft 146 which is driven by a sprocket wheel 147 as shown in FIGURE 10. Shaft 146 is supported on the upper frame structure of section C and the conical rollers 145 are adjustably mounted on shaft 146 so that they are spaced apart a distance equal to the width of the bundle. Intermediate rollers 150 clamp the mid portion of the sheet against an underneath anvil roller 151 in FIGURE 8 while the projecting side portions are folded and creased over the ends of roller 151 by conical rollers 145. The operation of feeder 102 is timed by a limit switch or other device actuated by the bundle or bottom wrapper so that, after folding, the top wrapper sheet will be placed on the bundle in longitudinal register with the bottom wrapper sheet as shown at bundle position B_3 in FIGURE 8.

The shafts 111 and 146 in section C are driven continuously by a motor 155. Conveyors 10 and 130 are motor driven as required to handle the work flow.

When single top and bottom wrappers are desired, piston 81 in FIGURE 7 remains in its upper position and is not actuated at any time. When single top and double bottom wrappers are desired, a valve controlling the piston 81 is arranged for actuation on alternate strokes of the piston in cylinder 66 so that after alternate feed movements of the needle bar 70, the needle bar will lift two sheets off the stack instead of one. Ordinarily, a single sheet is desired for the top wrapper but if a double sheet is desired for the top wrapper also, the piston 81 would be actuated to its lower position and allowed to remain there. Although the description of the operation refers to a single sheet wrapper top and bottom, it is to be understood that the wrapper feeding, dispensing and positioning devices will handle a double sheet wrapper in the same manner. A double wrapper may also be formed by feeding two single wrappers one after another onto the tray 96.

The movements of a bottom wrapper sheet through the machine are illustrated diagrammatically in FIGURE 11. At position 160 the right edge of the sheet has just been picked up and inserted into feed rolls 51 and 52 as

shown in FIGURE 6. At position 161 the sheet is travelling on belt conveyor 90 to the dispensing station on tray 96. At position 162 feed unit 101 has operated causing the sheet to leave tray 96 and enter the inclined guides 125, 126 in FIGURE 8. In position 163 the sheet has left feed unit 101 and has dropped by gravity against stop 127 in position to be engaged by an approaching bundle.

In position 164 the sheet is being carried forward by the bundle on conveyor 10 and forming wings 133 have started to fold up side portions 166 of the sheet. This stage corresponds approximately with bundle position B_2 in FIGURE 8. Finally, in position 165, the vertical folding plates 132 have folded side portions of the sheet up flat against the sides of the bundle.

The movements of a top wrapper sheet through the machine are illustrated diagrammatically in FIGURE 12. These phases of operation of the machine overlap the sequence of events just described for the bottom wrapper sheet so that the bundle may move continuously through the machine without stopping. At position 170 the sheet is being picked up by pickup assembly 45 from the same stack of sheets S and introduced between feed rolls 51 and 52. This does not occur until the bottom wrapper sheet has left dispensing tray 96. In position 171 the top wrapper sheet is approaching the dispensing tray on conveyor belts 90.

The top wrapper sheet waits on the dispensing tray 96 until the bottom wrapper sheet reaches approximately the position 165 in FIGURE 11 and then cylinders 142 drop the panels 140 and feeder 102 is activated to feed the top wrapper on top of the bundle. In position 172 side portions 176 of the sheet have dropped at one end with the lowering of panels 140 and in position 173 the leading end of the sheet has been deposited on top of the bundle. Position 173 corresponds approximately with position 166 of the bottom wrapper.

In order to obtain longitudinal registry of the top and bottom wrappers, the feed rollers 110 in feeder 102 preferably move the wrapper at the same speed the bundle is travelling on conveyor 10. Finally, the side portions 176 of the top wrapper are down folded and creased by cones 145 as represented by position 174 and the folded wrapper is deposited on top of the bundle as shown in FIGURE 8. When the top wrapper has left the dispensing tray, the pickup assembly 45 re-cycles to place another sheet thereon for use as a bottom wrapper on the next bundle.

FIGURE 13 shows how the bundle B appears after it emerges from the machine with the top wrapper S_T and bottom wrapper S_B applied. The wrapper papers are stiff and heavy enough to hold themselves in this position while the bundle passes into a binding or strapping machine to apply a transverse binding. Entry guides may be employed when the wrappers are more flexible and limp. An automatic folding machine not included in the present invention then folds the wrappers over the ends of the bundle and a longitudinal binding is applied.

The various functions of the machine are timed primarily by limit switches or light beams and electric eyes actuated by the wrappers and the bundle. Electrical and pneumatic systems with relays and solenoid valves control the various cylinders to perform the operations described, as will be understood by persons skilled in the art. When needle bar 70 makes contact with the stack of wrapper sheets, the arrested downward movement of this piston in cylinder 60 causes the air pressure to build up in the upper end of the cylinder. This pressure increase is utilized to operate a pressure switch for operating the needle pinch piston 77. Cylinders 60 and 66 are controlled in part by limit switches actuated by the members moved by these switches.

Dispensing tray 96 may be fed from either or both sides. For example, bottom wrappers may be fed in from one side and top wrappers fed in from the opposite side. The machine is not limited to use with precut and stacked wrappers. The dispensing section C may also be fed from a continuous roll or rolls of paper which is cut to wrapper lengths as it enters the machine. Still other feeding arrangements may be employed with roll paper. The form of construction and arrangement of parts permits convenient adjustment for handling bundles of different sizes.

Having now described our invention and in what manner the same may be used, what we claim as new and desire to protect by Letters Patent is:

1. A wrapper dispenser comprising a bundle passageway, means for moving bundles in one direction through said passageway, guide means extending from the top to the bottom of said passageway arranged to support a bottom wrapper with a lower portion disposed below said bundle passageway and an upper portion disposed in upstanding position in said guide means as a curtain across said passageway in the path of an oncoming bundle so that said upper portion of the wrapper is bent down and carried along under the bundle as the bundle moves through the passageway, means for feeding bottom wrappers above said passageway into the top end of said guide means, and means for feeding top wrappers above said passageway in the direction of bundle movement and depositing the top wrappers on top of bundles leaving said passageway.

2. A wrapper dispenser as defined in claim 1 including means for up-folding side portions of the bottom wrapper against opposite sides of the bundle and means for down-folding opposite side portions of the top wrapper.

3. A wrapper dispenser comprising a bundle passageway, means for moving bundles in one direction through said passageway, guide means arranged to support a bottom wrapper with a lower portion disposed below said bundle passageway and an upper portion disposed in upstanding position as a curtain across said passageway in the path of an oncoming bundle so that said upper portion of the wrapper is bent down and carried along under the bundle as the bundle moves through the passageway, means for feeding bottom wrappers into said guide means, means for feeding top wrappers above said passageway in the direction of bundle movement and depositing the top wrappers on top of bundles leaving said passageway, means for up-folding side portions of the bottom wrapper against opposite sides of the bundle, and means for down-folding opposite side portions of the top wrapper, said up-folding means comprising stationary plates in said bundle passageway and said down-folding means comprising conical rollers at the discharge end of said bundle passageway.

4. A wrapper dispenser as defined in claim 1, said bundle moving means comprising a continuously operating conveyor and said wrappers being applied to the bundle while the bundle is in motion.

5. A wrapper dispenser comprising a bundle passageway, means for moving bundles in one direction through said passageway, guide means arranged to support a bottom wrapper with a lower portion disposed below said bundle passageway and an upper portion disposed in upstanding position as a curtain across said passageway in the path of an oncoming bundle so that said upper portion of the wrapper is bent down and carried along under the bundle as the bundle moves through the passageway, means for feeding bottom wrappers into said guide means, means for feeding top wrappers above said passageway in the direction of bundle movement and depositing the top wrappers on top of bundles leaving said passageway, a dispensing tray above said bundle passageway, means for feeding wrappers out of said tray comprising power driven rollers mounted for vertical movement above said tray, and means for pressing said rollers down against a wrapper in said tray and retracting said rollers upward.

6. A wrapper dispenser as defined in claim 5, said rollers comprising bottom wrapper feed rollers at one end of said tray adjacent the infeed end of said bundle passage-

way and top wrapper feed rollers at the opposite end of said tray adjacent the discharge end of said bundle passageway.

7. A wrapper dispenser comprising a bundle passageway, means for moving bundles in one direction through said passageway, guide means arranged to support a bottom wrapper with a lower portion disposed below said bundle passageway and an upper portion disposed in upstanding position as a curtain across said passageway in the path of an oncoming bundle so that said upper portion of the wrapper is bent down and carried along under the bundle as the bundle moves through the passageway, means for feeding bottom wrappers into said guide means, and means for feeding top wrappers above said passageway in the direction of bundle movement and depositing the top wrappers on top of bundles leaving said passageway, said guide means for supporting said bottom wrappers extending from the top to the bottom of said bundle passageway on opposite sides of the entrance end of said bundle passageway and inclined forwardly with lower end portions below said bundle passageway.

8. A wrapper dispenser as defined in claim 5 including means for feeding wrappers to said dispensing tray comprising an elevator platform for supporting a stack of wrappers, and selectively adjustable means for lifting wrappers from said stack either one at a time or two at a time.

9. A wrapper dispenser as defined in claim 5 including means for feeding wrappers to said dispensing tray comprising a needle bar pickup having two rows of needles, means to engage said needles in the top wrapper in a stack of wrappers ind rotate the needles of said two rows in opposite directions to grasp said top wrapper so that the top wrapper may be lifted from the stack by the needles.

10. A wrapper dispenser as defined in claim 9, said needle bar pickup having a set of short needles for lifting wrappers from said stack one at a time, a set of long needles for lifting wrappers from said stack two at a time, and means for shifting either one of said sets of needles into operative position and retracting the other set to inoperative positions.

11. A wrapper dispenser comprising a wrapper dispensing tray, a bundle passageway containing a bundle conveyor extending beneath said tray, means to feed top and bottom wrappers into said tray, wrapper guides extending upward from beneath said conveyor to one end of said tray at the entrance end of said passageway, means for feeding bottom wrappers from said tray into said guides in curtain position across said passageway to be carried along under oncoming bundles, means to fold side portions of said wrappers up against opposite sides of the bundles, means for feeding top wrappers from said tray and depositing them on bundles at the discharge end of said passageway, and means for down-folding opposite side portions of said top wrappers.

12. A wrapper dispenser comprising means for picking up either single or double wrappers from a stack of wrappers, means for inserting alternate ones of said picked up wrappers under bundles on a conveyor, means for folding up side portions of said wrappers against opposite sides of the bundles, means for depositing the remaining picked up wrappers on top of said bundles, and means for down-folding opposite side portions of said top wrappers.

13. A wrapper dispenser as defined in claim 2, said down-folding means comprising a driven shaft having a pair of wrapper feed rollers thereon, a pair of anvil rollers under said feed rollers, each anvil roller forming a nip with one of said feed rollers for feeding a top wrapper through said nips, and a pair of conical rollers on said shaft adjacent said feed rollers arranged to fold down and crease side portions of the top wrapper over the outer ends of said anvil rollers.

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