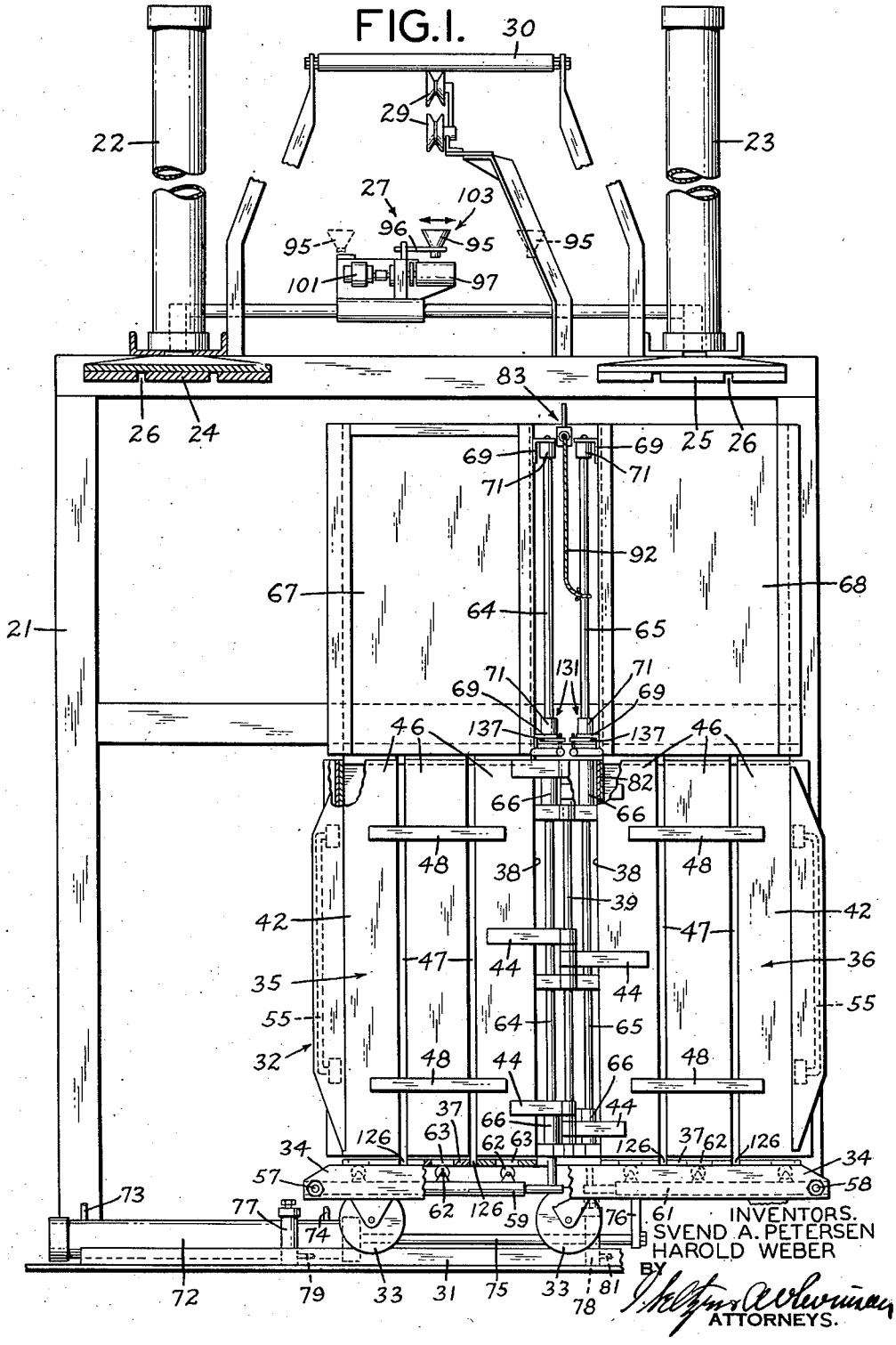
July 9, 1957 H. WEBER ET AL 2,798,348

PACKAGING OF TOW

Filed Dec. 21, 1951 4 Sheets-Sheet 1

FIG. 1.



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July 9, 1957 H. WEBER ET AL 2,798,348

PACKAGING OF TOW

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FIG. 2.

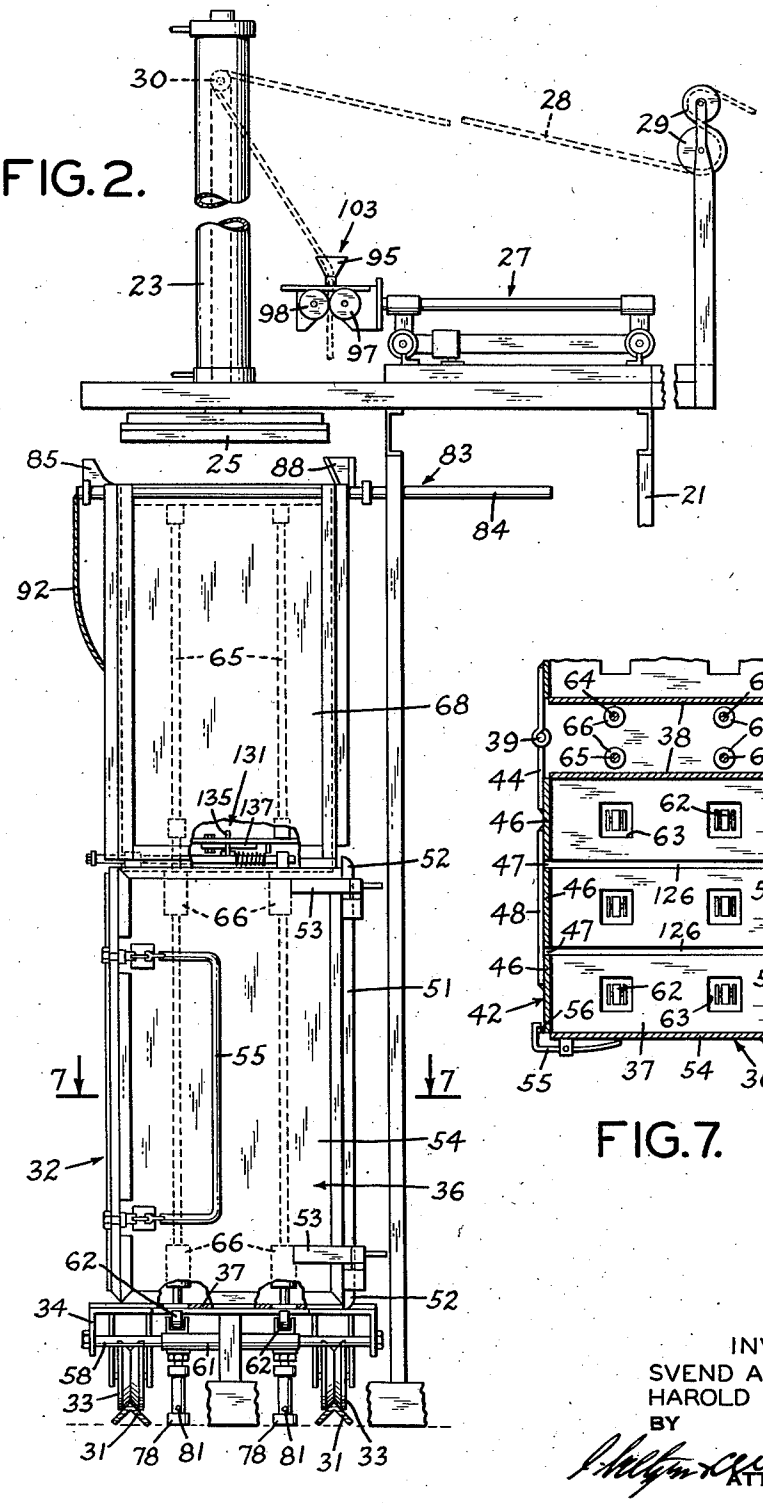


FIG. 7.

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July 9, 1957 H. WEBER ET AL 2,798,348

PACKAGING OF TOW

Filed Dec. 21, 1951 4 Sheets-Sheet 3

FIG.3.

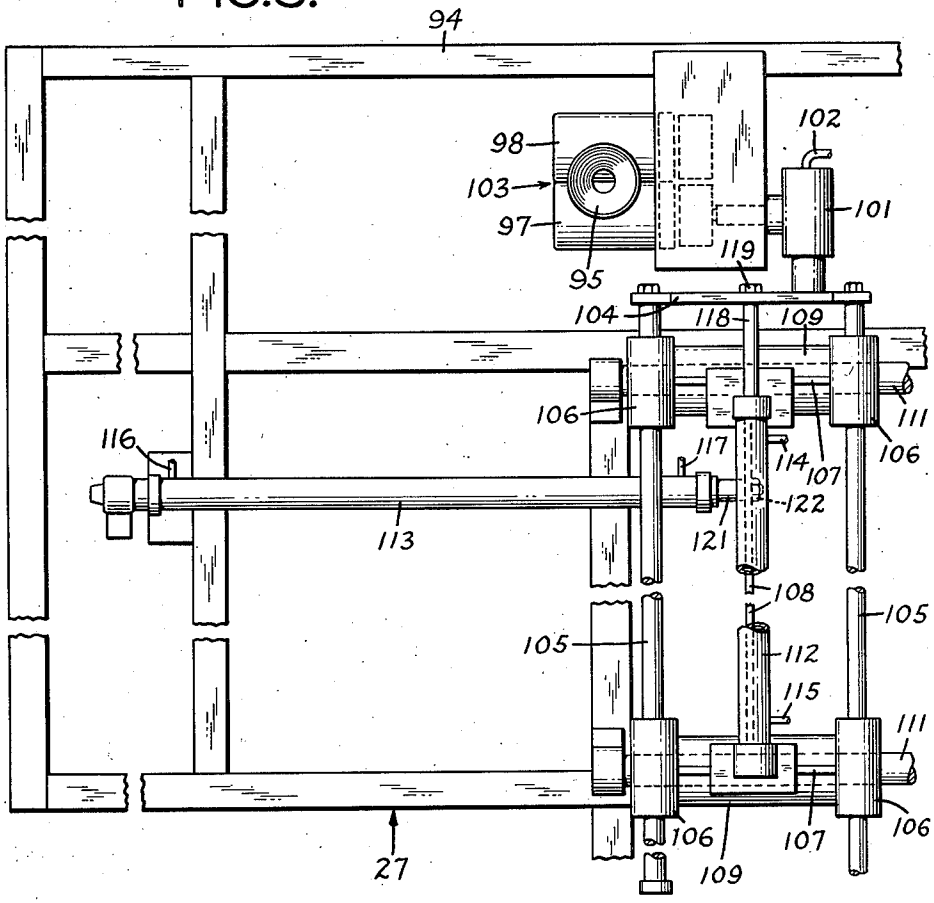
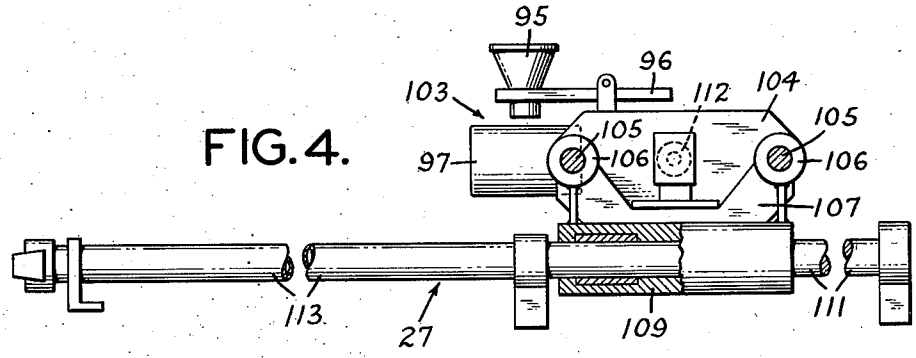


FIG.4.



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PACKAGING OF TOW

Filed Dec. 21, 1951 4 Sheets-Sheet 4

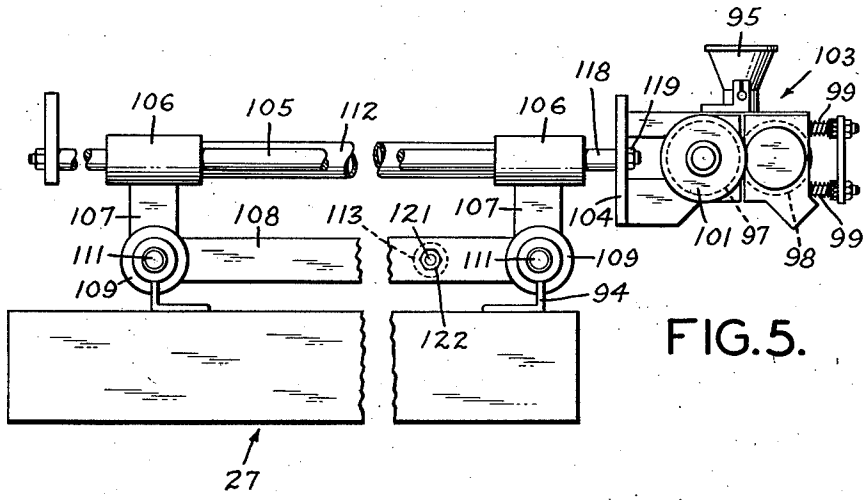


FIG.5.

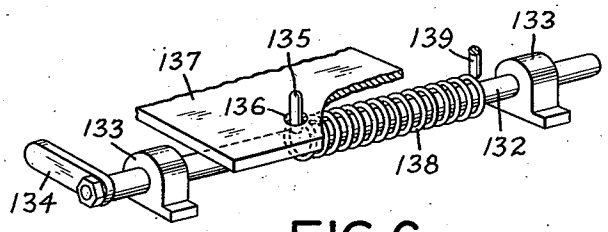
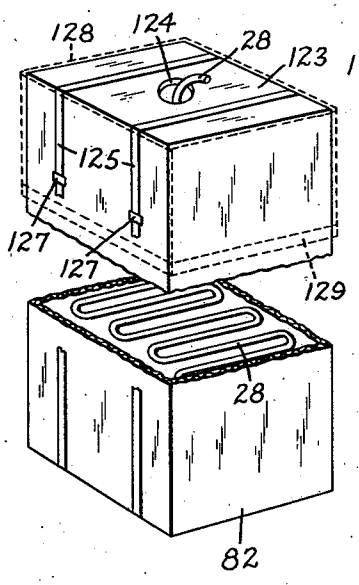


FIG.6.

FIG.9.



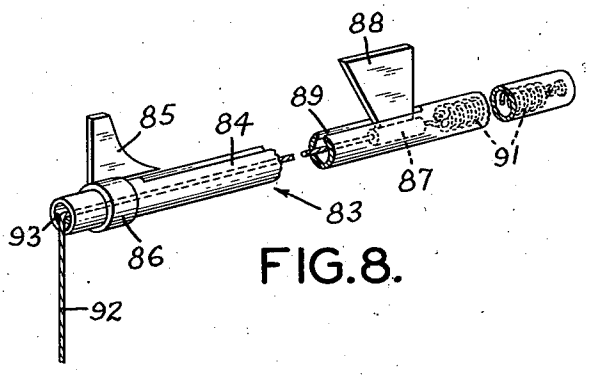


FIG.8.

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United States Patent Office

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Patented July 9, 1957

2,798,348

PACKAGING OF TOW

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Application December 21, 1951, Serial No. 262,856

16 Claims. (Cl. 53—124)

This invention relates to the packaging of tow and relates more particularly to a novel tow package and to a packaging apparatus for producing the same.

Filamentary materials are frequently obtained in the form of a tow, sliver or the like, hereinafter referred to as a tow, comprising a large number of continuous filaments or fibers arranged in a single strand or rope. In packaging the tow for storage, shipping and the like, it has been a general practice to wind the tow into a ball warp, i. e. a cylindrical tube having thereon a large number of turns of tow. The use of a ball warp type of package presents many difficulties in handling owing to its weight, which may be several hundred pounds, and to the necessity for rotatably supporting the same during the unwinding of the tow therefrom. The ball warp is also comparatively bulky owing to the space occupied by the cylindrical supporting tube and to the fact that it is not possible to compress the tow wound thereon to obtain a dense winding. In addition, when a crimped tow is wound on a ball warp it is found that the winding tension tends to remove a considerable amount of the crimp from the tow.

It is an important object of this invention to provide a novel tow package which will be free from the foregoing and other difficulties.

A further object of this invention is to provide a novel apparatus for producing tow packages.

Another object of this invention is to provide a novel tow package.

Other objects of this invention, together with certain details of construction and combinations of parts, will be apparent from the following detailed description and claims.

According to the present invention, there is provided a tow packaging apparatus comprising means for supporting two cartons into which the tow is to be packed. Positioned above one of the two cartons is a traversing mechanism which directs the tow into the said carton to obtain a compact package from which the tow can be drawn readily without tangling or snarling. A form of packing which has been found highly advantageous is to arrange the tow in the carton in pleated form, the pleats extending substantially across the entire width of the carton. The traverse mechanism employed to deposit the tow into the carton may comprise a feed mechanism for directing the tow into the carton and a pair of actuating means, arranged to operate at right angles to one another, for shifting the feed mechanism with respect to the carton to obtain the desired arrangement of the tow. Fluid operated cylinders have been found eminently suitable for operating the actuating mechanisms, particularly at high speeds.

Since the tow is relatively bulky, it will not form a dense package unless it is subjected to compression and its volume reduced considerably below that which it would normally occupy. To produce a full carton after compression, a filler sleeve is positioned above the carton so that a mass of tow having a volume larger than the

volume of the carton itself may be positioned in and above the carton. After the desired amount of tow has been deposited in one carton and in the filler sleeve positioned thereabove, the carton supporting apparatus is moved to bring the empty carton beneath the traversing mechanism, permitting the feed of the tow to continue without interruption. In order to produce a dense package, the tow positioned in and above the loaded carton is compressed to a volume not substantially in excess of the volume of the carton. For obtaining the desired degree of compression of the tow without the necessity for interrupting the feed of the tow, there are provided a pair of hydraulic cylinders carrying platens adapted, when the cylinders are energized, to come into contact with and compress the tow. One hydraulic cylinder is located at one side of the traverse mechanism and the other hydraulic cylinder is located at the other side of the traverse mechanism, and the hydraulic cylinders are positioned so that the platens will be aligned with a loaded carton of tow when the empty carton is moved to a point below the feed traverse mechanism.

It has been found that the most satisfactory tow packages are obtained when the degree of compression of the tow is such that the finished package has a density of between about 12.5 and 18.75 pounds per cubic foot. The tow is not damaged when subjected to the degree of compression necessary to produce a package of this density and the tow can be drawn from this package without snarling or tangling and without special apparatus. In addition, this degree of compression tends to retain the crimp in a crimped tow. It thus represents a considerable advance over the ball warps that have heretofore been widely employed for packaging tow.

A preferred embodiment of this invention will now be described in connection with the accompanying drawings wherein—

Fig. 1 is a front elevational view of the packaging apparatus,

Fig. 2 is a side elevational view of the packaging apparatus,

Fig. 3 is a top plan view of the traverse mechanism for distributing the tow,

Fig. 4 is a side elevational view of the traverse mechanism,

Fig. 5 is an end elevational view of the traverse mechanism,

Fig. 6 is a detail perspective view of the filler tube catch,

Fig. 7 is a cross-sectional view of one of the carton holders taken along the line 7—7 in Fig. 2 in the direction of the arrows,

Fig. 8 is a detail view of the cutter, and

Fig. 9 is a perspective view of the tow package, broken away to show the interior thereof.

Referring now to the drawings, the reference numeral 21 designates a framework on the upper portion of which are mounted hydraulic cylinders 22 and 23 carrying platens 24 and 25, respectively, having grooves 26 extending across the lower faces thereof. Mounted on the framework 21, between the cylinders 22 and 23, is a traverse mechanism indicated generally by reference numeral 27, which traverse mechanism will be described more fully hereinafter. A tow 28 (Fig. 2), from any suitable source (not shown), is directed to the traverse mechanism 27 by means of a pair of grooved guide wheels 29 and a freely rotatable guide bar 30.

Positioned on the floor beneath the cylinders 22 and 23 are a pair of angle-iron tracks 31 on which a carriage, indicated generally by reference numeral 32, is mounted by means of grooved casters 33 which ride on the said tracks. The carriage 32 comprises a frame 34 supported on the casters 33 and carrying a pair of carton holders

35 and 36 of identical construction, each comprising a base 37 and a side plate 38 extending substantially across the full width of the frame 34 (Fig. 7). Projecting vertically upward from the frame 34 between the side plates 38 are a pair of rods 39 and 41 to which a front wall 42 and a back wall 43, for each of the carton holders 35 and 36, are hingedly connected by means of strap hinges 44 and 45, respectively. The front wall 42 is made up of three plates 46 which are spaced from one another to form a pair of slots 47 extending the full height of said wall, and the said plates are joined to form a strong unitary structure by means of straps 48 that are welded to the faces thereof. The back wall 43 is similarly made up of three plates 49 that are spaced from one another to form a pair of slots 50 extending the full height of said wall. The plates 49 are joined to form a strong unitary structure by means of channeled connectors 51, the ends 52 of which are curved, that extend the length of and lie over the slots 50 and are welded to the said plates. Hingedly connected to the back wall 43 by means of strap hinges 53 is another wall 54 which is provided at its free end with a latch mechanism 55 that cooperates with a projection 56 on the free end of the front wall 42 to keep the walls of the carton holders in closed position.

Extending laterally across the ends of the carriage frame 34 are rods 57 and 58 on which are pivotally mounted platforms 59 and 61, respectively, each carrying two rows of casters 62 that are aligned with openings 63 in the base 37. Resting on the inner ends of the platforms 59 and 61 are pairs of rods 64 and 65 slidably mounted in bushings 66 that are secured to the side plates 38. Rectangular filler sleeves 67 and 68, having a cross-section slightly smaller than that of the carton holders 35 and 36, are fastened by means of brackets 69 and collars 71 to the upper ends of the pairs of rods 64 and 65, respectively, and the said filler sleeves normally extended for a short distance into the said carton holders.

A fluid-operated cylinder 72, to which fluid under pressure is supplied through conduits 73 and 74, causes the reciprocation of a piston rod 75 operatively connected to the carriage 32 by means of a bracket 76. Actuation of the fluid-operated piston rod 75 will move the carriage 32 to bring the carton holder 35 and the filler sleeve 67 beneath the platen 24, or the carton holder 36 and the filler sleeve 68 beneath the platen 25. In either of these positions, the other of the carton holders and filler sleeves will be positioned beneath the traverse mechanism 27. Two pairs of fluid-operated jacks 77 and 78, to which fluid under pressure is suplied through conduits 79 and 81, respectively, are located beneath the carriage 32. The pairs of jacks 77, whose function will be set forth hereinafter, are so positioned that they will be beneath the inner end of the platform 59 when the carriage 32 is moved to bring the carton holder 35 and the filler sleeve 67 beneath the platen 24. The pairs of jacks 78 are so positioned, as shown in Fig. 1 of the drawings, as to be beneath the inner end of the platform 61 when the carton holder 36 and the filler sleeve 68 are beneath the platen 25. During operation, cartons 82, having external dimensions substantially equal to the internal dimensions of the carton holders 35 and 36 are located in the said carton holders. The cartons 82 are sufficiently tall so that the filler sleeves 67 and 68 will extend for a short distance, of the order of about one-half inch, into said cartons, providing a smooth-surfaced guide to direct the tow 28 into the said cartons during the filling operation.

A cutter assembly, indicated generally by reference numeral 83, is positioned between and slightly above the upper ends of the filler sleeves 67 and 68. As shown in Fig. 8 of the drawings, the cutter assembly 83 comprises a tube 84 to one end of which a blade 85 is fastened by means of a clamp 86. A slider 87, mounted in the tube 84, carries a blade 88 that projects through a slot 89 extending along a substantial portion of the length of the

tube 84. The blade 88 is normally maintained at the end of the slot furthest removed from the blade 85 by means of a helical spring 91 that is fastened at one end to the tube 84 and at the other end to the slider 87. To operate the cutter assembly 83, there is provided a rope 92, fastened to the slider 87, which is guided out of the tube 84 by means of a pin 93 extending across the open end of said tube. By pulling on the rope 92 it is possible to draw the blade 88 into cutting engagement with blade 85 to sever the tow 28 as will be described hereinafter. The cutting edge of the blade 88 is inclined at a sharper angle to the vertical than the cutting edge of the blade 85 to provide a scissor-like cutting action during the cutting operation. When the rope 92 is released, the spring 91 will draw the slider 87 and the blade 88 secured thereto back to the position shown in Fig. 8 of the drawings.

The tow 28 is delivered to the filler sleeve 67 or 68 and to the carton 82 by means of the traverse mechanism 27, the details of which are shown in Figs. 3, 4 and 5 of the drawings. Referring now to these figures, the traverse mechanism 27 is supported on a framework 94 resting on the framework 21 and comprises a guiding funnel 95 mounted on a bracket 96. The guiding funnel 95 is adapted to receive the tow 28 from the guide bar 30 and directs the same to the nip of a pair of feed rolls 97 and 98, which are urged toward each other by springs 99. The feed roll 97 is positively rotated to move the tow 28 at the desired rate by means of a fluid-operated motor 101 connected thereto to which fluid under pressure is supplied through a conduit 102. From the nip of the feed rolls 97 and 98, the tow 28 drops into the carton 82 which is positioned beneath the traverse mechanism 27.

The funnel 95, the feed rolls 97 and 98, and the fluid-operated motor 101 constitute a feed assembly 103, which is mounted on a plate 104 fastened to rods 105 slidably mounted in bushings 106 carried by brackets 107, joined together by cross-piece 108. The brackets 107 are themselves slidably mounted, by means of bushings 109, on rods 111 supported by the framework 94. To traverse the feed assembly 103 to lay the tow 28 into the carton 82 in the desired pattern, there are provided a pair of fluid-operated cylinders 112 and 113 to which fluid under pressure is supplied by means of conduits 114 and 115, 116 and 117, respectively (Fig. 3). The fluid-operated cylinder 112 is mounted between the brackets 107 and has a piston rod 118 extending therefrom and fastened to the plate 104 by means of a nut 119. The fluid-operated cylinder 113 is mounted on the framework 94 and has a piston rod 121 extending therefrom and fastened to the cross-piece 108 by means of a nut 122. When the fluid-operated cylinder 112 is energized it will cause the rods 105 to slide back and forth in the bushings 106, whereas, when the fluid-operated cylinder 113 is energized it will cause the brackets 107 to slide back and forth on the rods 111. By adjusting the relative speeds of the fluid-operated motor 101, the fluid-operated cylinder 112 and the fluid-operated cylinder 113, it is possible to lay the tow 28 into the carton 82 in any desired pattern to obtain a uniform packing of the said tow to form a package from which the tow may be withdrawn readily without snarling or tangling.

During operation, a carton 82 is positioned in each of the carton holders 35 and 36 and the traverse mechanism 27 is operated to feed the tow 28 into the carton 82 positioned beneath said traverse mechanism which, in Fig. 1 of the drawings is in the carton holder 35. It has been found that a uniform packing of the tow 28 may be obtained if the fluid-operated cylinder 112 is operated to cause its piston 118 to move at a linear traverse rate of about one-twentieth the linear rate at which the tow is drawn between the feed rolls 97 and 98 and the fluid-operated cylinder 113 is operated to cause its piston 121 to move at a relatively slow rate to lay the successive portions of the tow in side by side relation to produce a fold or pleat arrangement as shown in Fig. 9 of the draw-

ings. Filling of the carton 82 positioned in the carton holder 35 is continued until the desired amount of tow is deposited in the said carton, as determined, for example, by measuring the length of the tow. At this time, the tow 28 will not only fill the carton 82, but will also fill a major portion of the filler sleeve 67 positioned above the said carton because of the bulk of said tow.

When the desired amount of tow 28 is deposited in the carton 82 in the carton holder 35, the fluid-operated cylinder 72 is actuated to cause its piston rod 75 to move the carriage 32 to bring the carton holder 35 and the filler sleeve 67 beneath the platen 24 of the hydraulic cylinder 22. With the carriage 32 in this position, the carton holder 36 and the filler sleeve 68 will be positioned beneath the traverse mechanism 27 and the tow 28 will be deposited in the carton 82 in the said carton holder 36. The cutter assembly 83 is then operated by pulling the rope 92 to cut the tow 28. A cap 123 having an aperture 124 therein is then placed over the mass of tow 28 in the filler sleeve 67 and the end of said tow is drawn through the said aperture to permit ready access to the same when desired. At this time, the hydraulic cylinder 22 is actuated to move the platen 24 down to compress the tow 28 to a volume not substantially exceeding the volume of the carton 82. When the mass of tow 28 has been compressed in this manner, the fluid-operated jacks 77 are actuated and will rotate the platform 59 about the rod 57 until the rows of casters 62 come into contact with the base of the carton 82. Because of the downward force exerted by the platen 24, no further rotation of the platform 59 will take place. However, the rotation of the platform 59 which does occur raises the pair of rods 64 a sufficient distance to lift the filler sleeve 67 out of the carton 82. This provides sufficient clearance to permit straps 125 to be inserted into and through the grooves 26 in the lower face of the platen 24. The straps 125 will then enter the channeled connectors 51 in the back wall 43 of the carton holder 35 and will be directed by the said connectors into grooves 126 extending across the upper face of the base 37. After the ends of the straps 125 emerge from the grooves 126, they are guided into the channels 47 under the straps 48 and the ends of said straps 125 are joined together by means of clips 127 to hold the tow 28 in the carton 82 compressed. The latch 55 is then opened and the walls 42, 43 and 54 of the carton holder 35 are swung away from the walls of the carton 82. With the walls of the carton holder 35 clear of the carton, the hydraulic cylinder 22 is actuated to raise the platen 24. As the platen 24 moves away from contact with the carton 82, the fluid-operated jacks 77, which are still actuated, will cause a further rotation of the platform 59 about the rods 57, raising the carton 82 off the base 37 on the rows of casters 62 and causing the said carton to slide out of the carton holder 35. A cover 128 is placed over the top of the carton 82 to seal the same and is secured in place by means of a gummed band 129.

Following removal of the filled carton 82 from the carton holder 35, the fluid-operated jacks 77 are de-actuated, permitting the platform 59 to return to its original position. To hold the filler sleeve 67 in a raised position to permit an empty carton 82 to be placed in the carton holder 35, there is provided a latch mechanism 131, the construction of which is shown in Fig. 6 of the drawings. The latch mechanism 131 comprises a rod 132 slideably journalled in bushings 133 and having an operating handle 134 fastened to the front end thereof. Fastened to the rod 132 is a pin 135 that projects through an aperture 136 in plate 137 fastened to the filler sleeve 67 when the said filler sleeve is in its lowermost position. Encircling the rod 132 is a helical spring 138 that is compressed between a fixed stop 139 and the pin 135 and that tends to urge the rod 132 to move in a direction toward the front of the tow packaging apparatus. When the filler sleeve 67 is raised by operation of the fluid-operated jacks 77, the plate 137 will be lifted clear of the pin 135, permitting the spring 138 to move the rod 132 to a position where the pin 135 is no longer aligned with the aperture 136. Upon de-actuation of the fluid-operated jacks 77, the filler sleeve 67 will drop until the plate 137 rests on the pin 135. An empty carton 82 is then placed in the carton holder 35, the said carton holder is closed and latched, and the handle 134 is then pressed to move the rod 132 to a position where the pin 135 is again in alignment with the aperture 136. The filler sleeve 67 will then drop until it extends for a short distance into the carton 82, bringing the apparatus into readiness for another load of the tow 28.

When the desired amount of tow 28 has been deposited into the carton 82 in the carton holder 36 and into the filler sleeve 68, the fluid-operated cylinder 72 is again actuated to move the carriage 32 to bring the said carton holder 36 and filler sleeve 68 beneath the platen 25 of the hydraulic cylinder 23. In this position of the carriage 32, the carton holder 35 and the filler sleeve 67 will be positioned beneath the traverse mechanism 27 to receive the tow 28 and the entire cycle of operations will be repeated.

It is to be understood that the foregoing detailed description will be given merely by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

Having described our invention, what we desire to secure by Letters Patent is:

1. A tow packaging apparatus comprising means for supporting two cartons for longitudinal movement, traverse means movable relative to said cartons for directing a tow into one of said cartons so that it will have a predetermined arrangement in said carton, and means for longitudinally shifting said carton supporting means to bring a carton located in one or the other of said carton supporting means to a position to receive the tow from said traverse means.

2. A tow packaging apparatus comprising means for supporting two cartons, traverse means for directing a tow into one of said cartons, means for shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means and a pair of means for compressing said tow, one of said pair of compressing means being located to one side of said traverse means in a position to compress the tow in a carton positioned in one of said carton supporting means and the other of said pair of compressing means being located to the other side of said traverse means in a position to compress the tow in a carton positioned in the other of said carton supporting means.

3. A tow packaging apparatus comprising means for supporting two cartons, filler sleeves positioned above said carton supporting means, traverse means for directing a tow into one of said cartons, means for shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means and a pair of means for compressing said tow, one of said pair of compressing means being located to one side of said traverse means in a position to compress the tow in a carton positioned in one of said carton supporting means, and the other of said pair of compressing means being located to the other side of said traverse means in a position to compress the tow in a carton positioned in the other of said carton supporting means.

4. A tow packaging apparatus comprising means for supporting two cartons for longitudinal movement, traverse means for directing a tow into one of said cartons, means for longitudinally shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means and cutter means positioned between

said carton supporting means for severing the tow after the shifting means has been operated.

5. A tow packaging apparatus comprising means for supporting two cartons, traverse means for directing a tow into one of said cartons, means for shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means, filler sleeves positioned above said carton supporting means and adapted normally to extend into said cartons, means for raising said filler sleeves out of said cartons, and latch means for holding said filler sleeves in a raised position clear of said cartons.

6. A tow packaging apparatus comprising means for supporting two cartons, traverse means for directing a tow into one of said cartons, means for shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means, filler sleeves positioned above said carton supporting means, and adapted normally to extend into said cartons, means for raising said filler sleeves out of said cartons, latch means for holding said filler sleeves in a raised position clear of said cartons and a pair of means for compressing said tow, one of said pair of compressing means being located to one side of said traverse means in a position to compress the tow in a carton positioned in one of said carton supporting means and the other of said pair of compressing means being located to the other side of said traverse means in a position to compress the tow in a carton positioned in the other of said carton supporting means.

7. A tow packaging apparatus comprising means for supporting two cartons, traverse means for directing a tow into one of said cartons, means for shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means, filler sleeves positioned above said carton supporting means and adapted normally to extend into said cartons, means for raising said filler sleeves out of said cartons, latch means for holding said filler sleeves in a raised position clear of said cartons and a pair of means for compressing said tow, one of said pair of compressing means being located to one side of said traverse means in a position to compress the tow in a carton positioned in one of said carton supporting means and the other of said pair of compressing means being located to the other side of said traverse means in a position to compress the tow in a carton positioned in the other of said carton supporting means and cutter means positioned between said carton supporting means for severing the tow after the shifting means has been operated.

8. In a tow packaging apparatus, means for supporting a carton, and traversing means for directing a tow into said carton, said traversing means comprising feed means for said tow, and a pair of fluid-operated cylinders arranged to operate at right angles to one another to shift the feed means with respect to said carton to obtain the desired arrangement of the tow in the carton.

9. In a tow packaging apparatus, means for supporting a carton, and traversing means for directing a tow into said carton, said traversing means comprising feed rolls for pulling said tow into said carton, and a pair of fluid-operated cylinders arranged to operate at right angles to one another to shift the feed rolls with respect to said carton to obtain the desired arrangement of the tow in the carton.

10. A tow packaging apparatus comprising means for supporting two cartons, traverse means for directing a tow into one of said cartons, means for shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means, said traversing means comprising feed means for said tow, and a pair of fluid-operated cylinders arranged to operate at right angles to one another to shift the feed means with respect to said carton to obtain the desired arrangement of the carton.

11. In a packaging apparatus, means for supporting a carton, means for urging said carton in a given direction, and means for urging said carton in the opposite direction and for compressing the material in said carton, said compressing means exerting a greater force on said carton than said first mentioned means for urging the carton in a given direction whereby the carton will not move while the compressing means is applied but will move when the compressing means is released.

12. In a packaging apparatus, pivotally mounted means adapted to engage one face of a carton, means for urging said pivotally mounted means against the carton to urge the carton in a given direction, and means for urging said carton in the opposite direction and for compressing the material in said carton, said compressing means exerting a greater force on said carton than said pivotally mounted means whereby the carton will not move while the compressing means is applied but the pivotally mounted means will move to tip the carton when the compressing means is released.

13. In a packaging apparatus, means for supporting a carton, pivotally mounted means positioned beneath said supporting means, engaging means secured to said pivotally mounted means and adapted on movement of said pivotally mounted means to extend through said supporting means to contact the carton, and means for moving said pivotally mounted means to bring said engaging means into contact with the carton and tip the carton.

14. A tow packaging apparatus comprising means for supporting two cartons, traverse means for directing a tow into one of said cartons, means for shifting said carton supporting means to bring a carton located in a predetermined carton supporting means to a position to receive the tow from said traverse means, filler sleeves positioned above said carton supporting means, and adapted normally to extend into said cartons, means for raising said filler sleeves out of said cartons, latch means for holding said filler sleeves in a raised position clear of said cartons, a pair of means for compressing said tow, one of said pair of compressing means being located to one side of said traverse means in a position to compress the tow in a carton positioned in one of said carton supporting means and the other of said pair of compressing means being located to the other side of said traverse means in a position to compress the tow in a carton positioned in the other of said carton supporting means, and means for urging said carton in a direction opposite to the direction in which the carton is urged by the compressing means, said compressing means exerting a greater force on said carton than said means for urging said carton in a given direction whereby the carton will not move while the compressing means is applied but will move when the compressing means is released.

15. A tow packaging apparatus comprising means for supporting two cartons, traverse means for directing said tow into one of said cartons, means for shifting said carton supporting means to a position to receive the tow from said traverse means, filler sleeves positioned above said carton supporting means and adapted normally to extend into said cartons, means for raising said filler sleeves out of said cartons, latch means for holding said filler sleeves in a raised position clear of said cartons, a pair of means for compressing said tow, one of said pair of compressing means being located to one side of said traverse means in a position to compress the tow in a carton positioned in one of said carton supporting means and the other of said pair of compressing means being located to the other side of said traverse means in a position to compress the tow in a carton positioned in

the other of said carton supporting means, cutter means positioned between said carton supporting means for severing the tow after the shifting means has been operated, pivotally mounted means positioned beneath said carton supporting means, engaging means secured to said pivotally mounted means out of contact with said carton and adapted on movement of said pivotally mounted means to extend through said carton supporting means to contact said carton, means for moving said pivotally mounted means to bring said engaging means into contact with the carton to urge the carton in a direction opposite to the direction in which the carton is urged by the compressing means, and means operatively connecting the pivotally mounted means to the means for raising the filler sleeve whereby the initial movement of the pivotally mounted means raises the filler sleeve, said compressing means exerting a greater force on said carton than said pivotally mounted means whereby the carton will not move when the compressing means is applied but the pivotally mounted means will move to tip the carton when the compressing means is released.

16. A package of tow comprising a carton of rectangular cross-section having a crimped tow of continuous filaments positioned therein and arranged in pleats extending back and forth substantially across the entire

width of the carton, the pleats of tow being arranged in superimposed layers having a number of parallel pleats in each layer, successive pleats being disposed in regular side-by-side relationship, said tow being compressed to a density of between about 12.5 and 18.75 pounds per cubic foot.

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