Jan. 11, 1966 K. P. LEE 3,228,620

YARDAGE COMBINE

Filed July 29, 1963 5 Sheets-Sheet 1

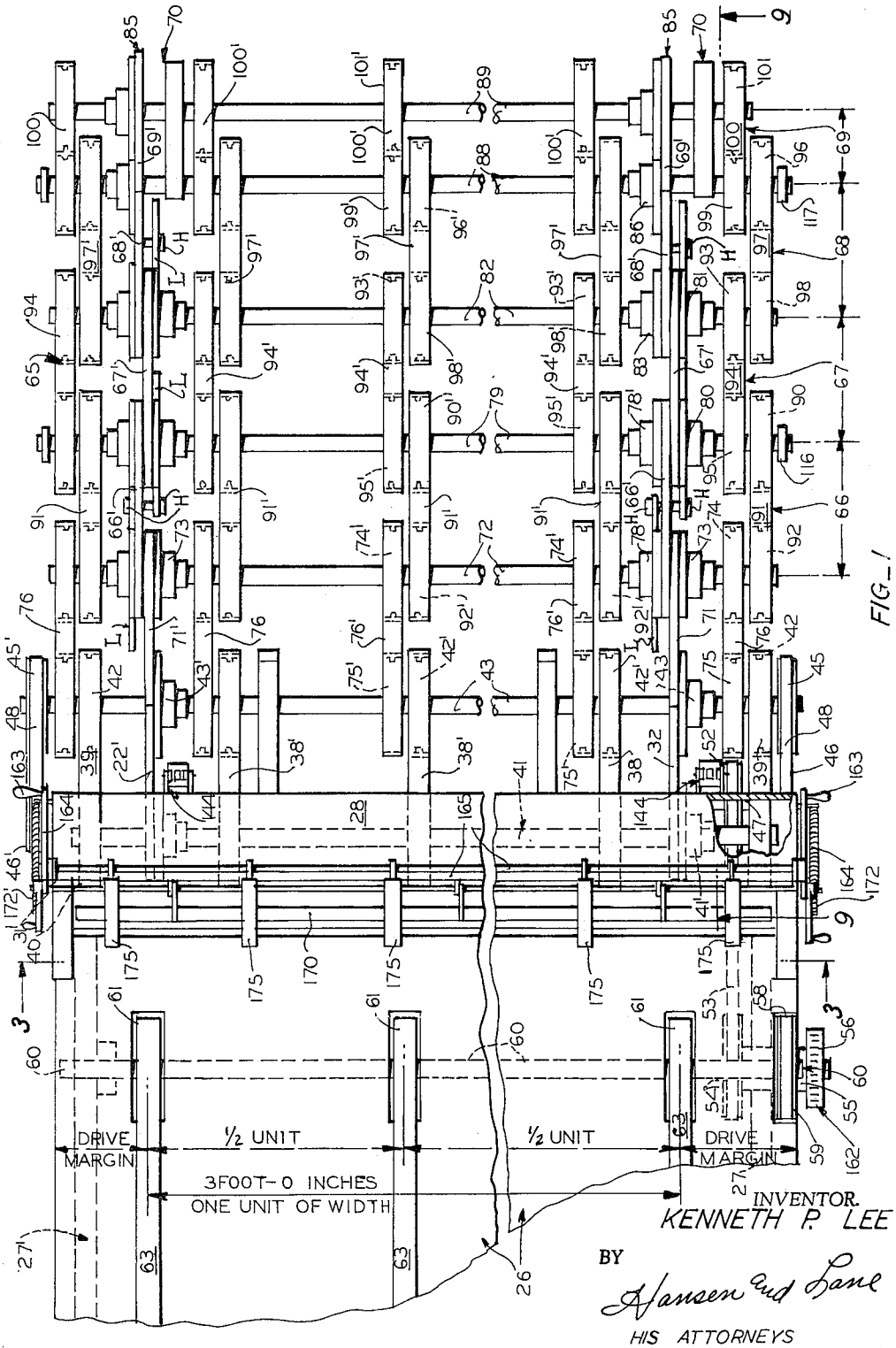

FIG_1

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YARDAGE COMBINE

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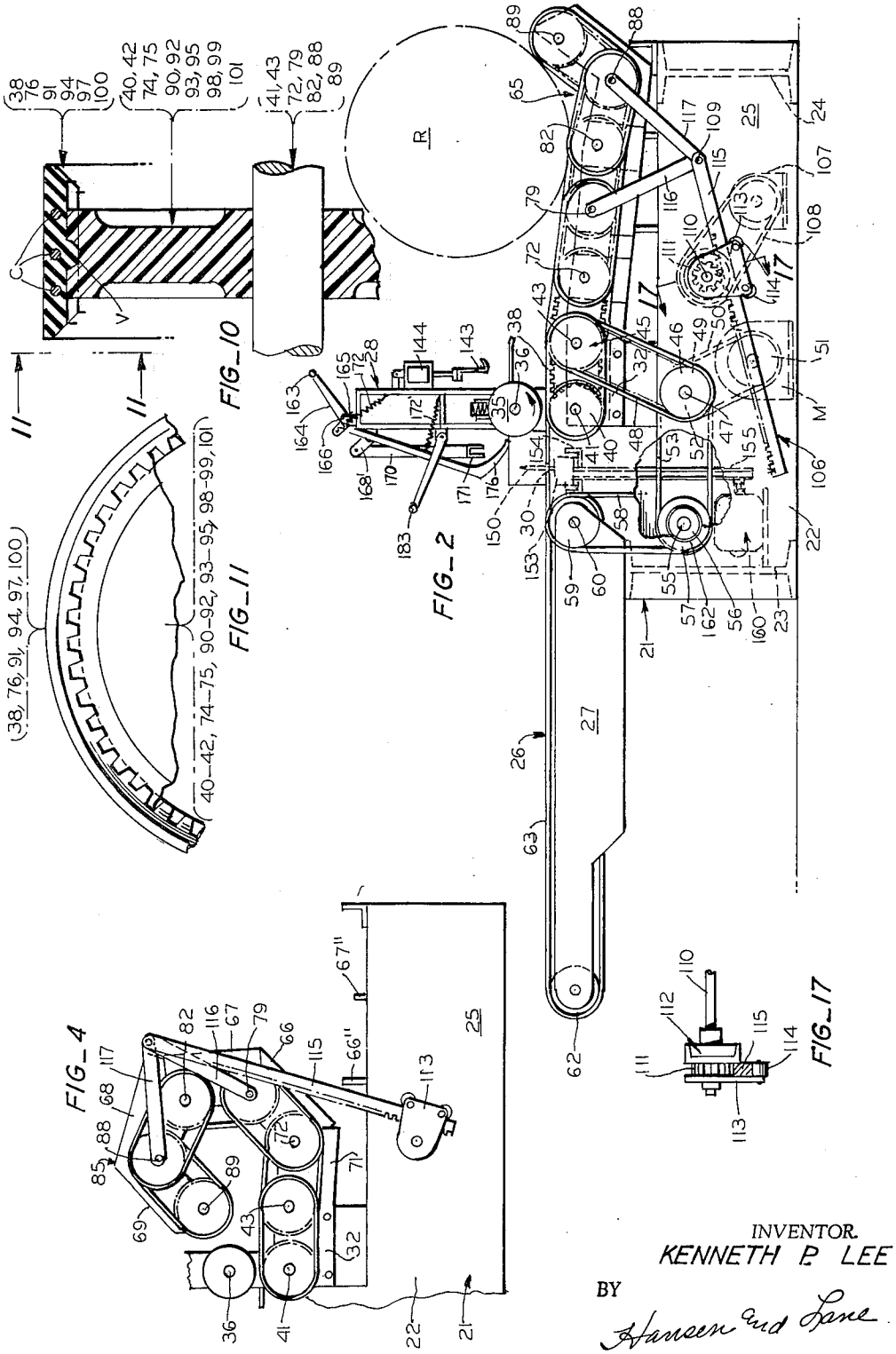

FIG_10

FIG_11

FIG_2

FIG_4

FIG_17

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YARDAGE COMBINE

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FIG_3

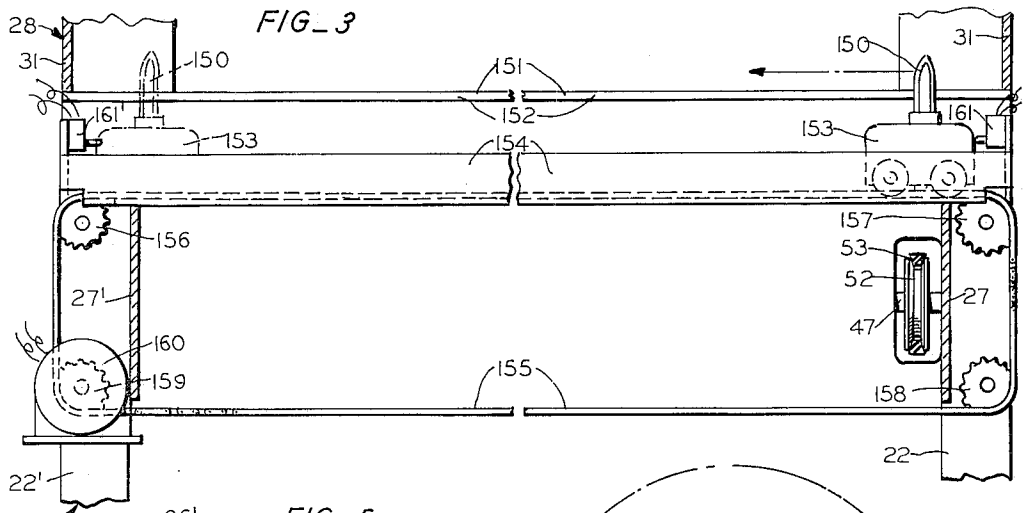


FIG_5

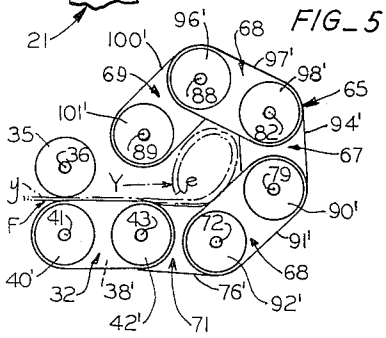


FIG_7

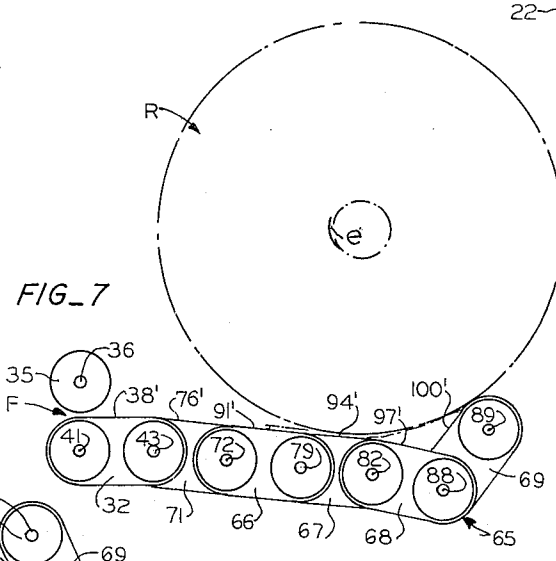


FIG_6

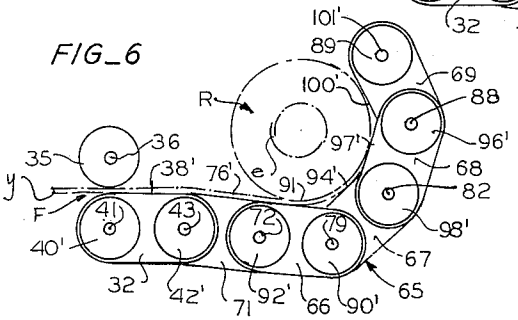


FIG_13

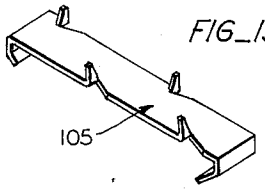
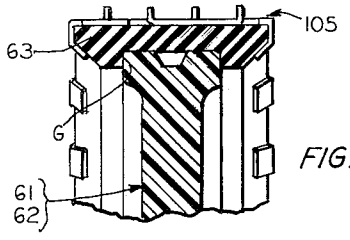


FIG_12



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YARDAGE COMBINE

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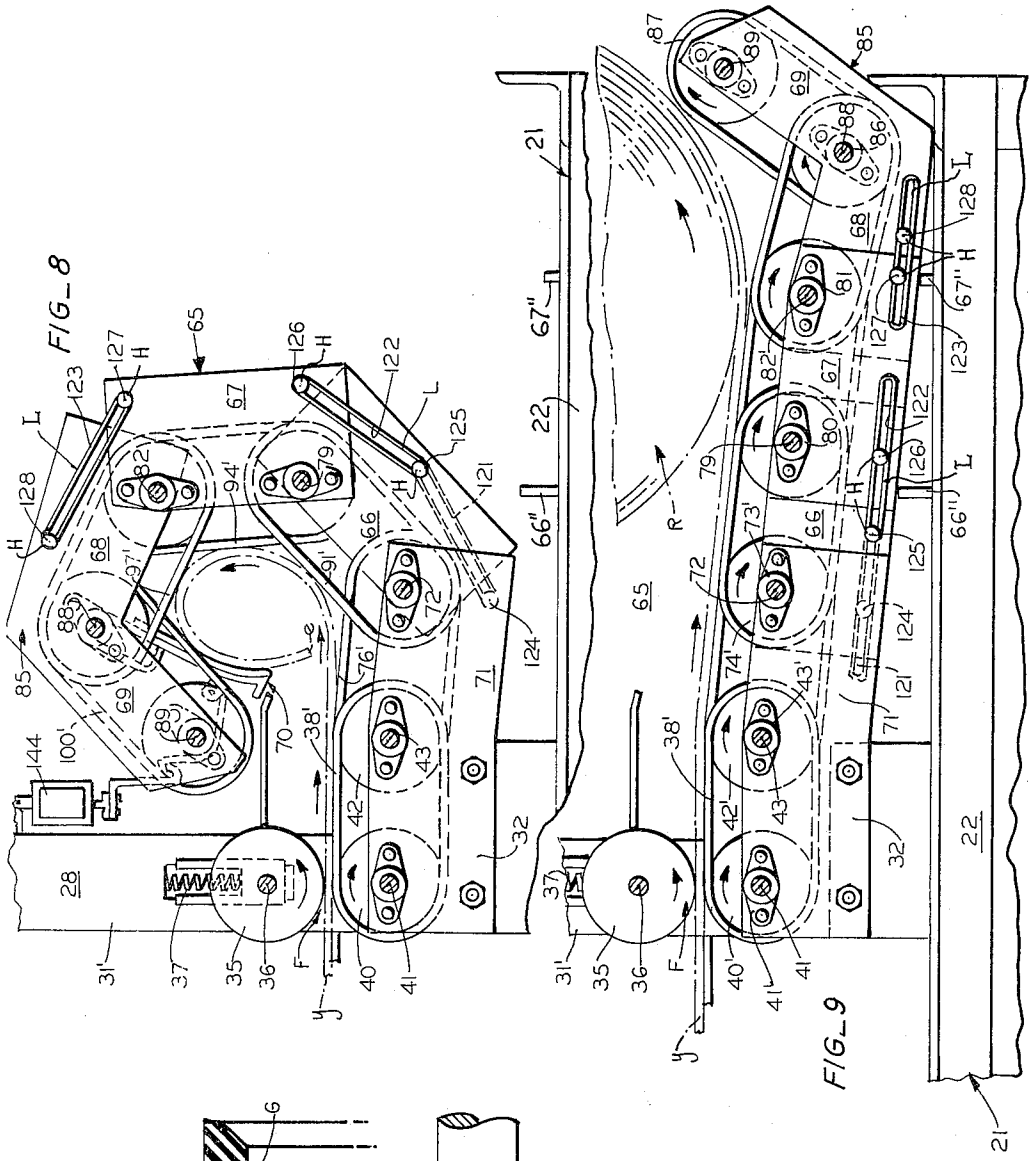

FIG_8

FIG_9

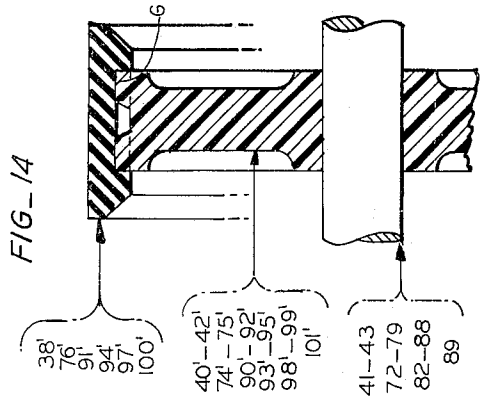

FIG_14

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FIG_15

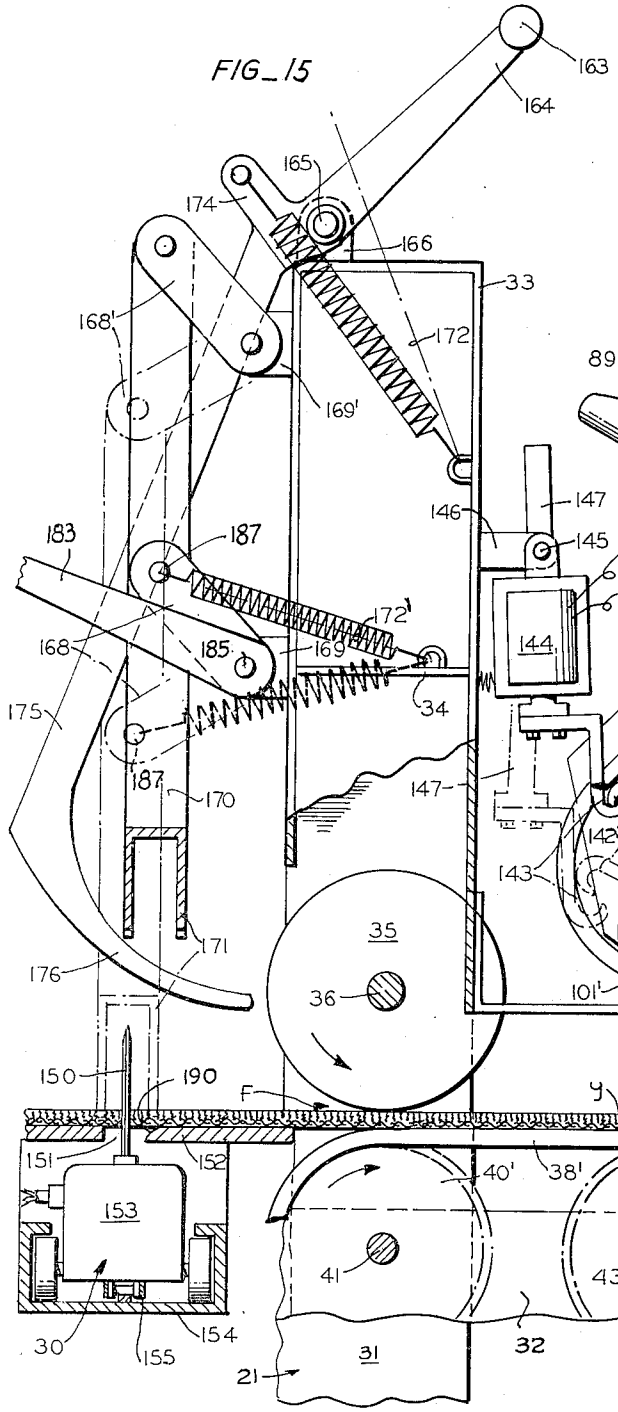
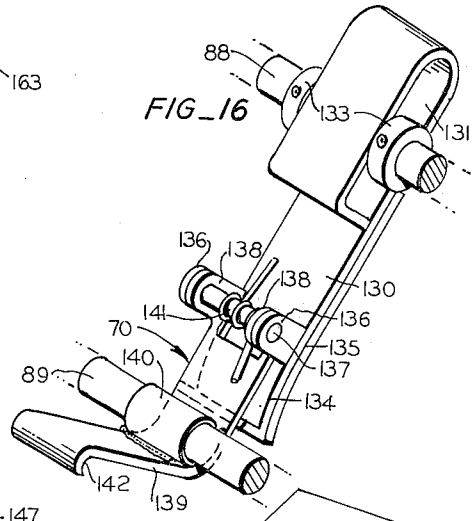


FIG_16



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United States Patent Office

3,228,620

Patented Jan. 11, 1966

3,228,620

YARDAGE COMBINE

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Filed July 29, 1963, Ser. No. 298,042
13 Claims. (Cl. 242—56)

This invention relates to yardage handling apparatus and more particularly to a device for measuring, cutting, feeding, rolling and/or unrolling sheet material. In view of the manifold purposes of the present apparatus I prefer to call it a yardage combine.

One of the objects of the present invention is to provide a machine for handling continuous sheets of rollable material. In connection with this object the present invention contemplates the provision of an apparatus for automatically measuring such material during feeding thereof; coiling the material into a roll without regard to its speed of travel; squaring the material; cutting the same square to the length to minimize loss of material; and for facilitating wrapping and/or binding of the rolled material.

It is another object of the present invention to provide a yardage handling machine which after receiving the material to be handled requires no man power for lifting or transferring the material until the job is accomplished. In connection with this object it should be understood that heretofore yardage on bolts, poles or tubes had to be lifted onto trunnion supports for unrolling; hand pulled and measured when stretched out on a flat surface; rewound and/or folded by hand and thereafter lifted and shifted about for wrapping incident to shipping and/or transfer to a site of use. With the present apparatus once the sheet material is fed into the apparatus, the machinery takes over, no further man power being required other than operation of the controls.

These and other objects and advantages of the present invention will become apparent from a reading of the following description and claims in the light of the accompanying five sheets of drawings in which:

FIG. 1 is a plan view of the yardage combine of the present invention.

FIG. 2 is a side elevation of FIG. 1.

FIG. 3 is a transverse section through the feed table and showing a cutting mechanism at that location.

FIG. 4 is a fragmentary side elevation of a portion of FIG. 2 with parts thereof in a different position.

FIG. 5 is a schematic diagram of that portion of the machine shown in FIGS. 4, 8 and 15.

FIG. 6 is a schematic diagram of the parts shown in FIG. 5 developed to an intermediate stage.

FIG. 7 is a schematic diagram of the parts shown in FIGS. 5 and 6 developed to a terminal stage of operation and as shown in detail in FIGS. 2 and 9.

FIG. 8 is a fragmentary vertical section through the yardage rollup phase of the apparatus upon receipt of the first end of the material.

FIG. 9 is a fragmentary vertical section through the rollup phase of the apparatus as seen from line 9—9 in FIG. 1 and as disposed at the termination of the rolling up of the material.

FIG. 10 is a fragmentary radial section through a drive pulley and belt employed in the apparatus.

FIG. 11 is a partial side elevation of FIG. 10 as seen along line 11—11 thereof.

FIG. 12 is a fragmentary section through a feed table pulley and belt.

FIG. 13 is a perspective view of a material gripper employed on the feed belt of FIG. 12.

FIG. 14 is a fragmentary radial section through a material supporting belt and pulley therefor.

FIG. 15 is an enlarged detail section through the feed end of the yardage combine and the material holding and cutting mechanism associated therewith.

FIG. 16 is a perspective view of a part illustrated in FIG. 15 in conjunction with the guidance of the first end of the material into a first convolute of a roll formed in the material.

FIG. 17 is a section through a slip clutch drive of FIG. 2 and taken substantially along line 17—17 thereof.

For purposes of the present application the apparatus will be described as adapted for the handling of carpeting. However, it should be understood that the present apparatus is suitable for handling various other materials in the nature of flat continuous sheets of woven, matted, meshed, pressed, extruded material capable of being rolled, as for example woven fabrics, wire, silks, linoleum, wallpaper and sheet metal such as aluminum galvanized iron and/or stainless steel and the like which are sufficiently flexible to be handled, measured, rolled and cut with equal success and ease by the same apparatus.

In most cases sheet material comes in standard widths. Carpeting, for example, comes from the loom in widths of 27 inches and sometimes on special order four and a half feet (54 inches) for hall and stair runners. Ordinarily, however, carpeting comes in widths based upon 3 foot (36 inch) increments measuring in feet as follows: 3, 6, 9, 12, 15 and so forth.

With the foregoing in mind it will be noted in FIG. 1 that the apparatus 20 is of a width determined by units divisible by 3 to handle standard widths of material such as carpeting. In the present disclosure the units of width of each component is assumed to be 18 inches whereby two such units will support and handle a three foot web or ribbon of carpeting as well as 27 inch runners. As illustrated in FIG. 1 the entire apparatus is depicted as severed longitudinally between one 18 inch component and serves to illustrate the machine developed into three foot increments to handle 6, 9, 12 and 15 foot widths as desired and/or required.

Both sides of the apparatus on either side of the web supporting center components extend sufficiently beyond the latter to provide drive margins to accommodate drive means and controls therefor, later to be explained.

Referring to FIGS. 2 and 4 the apparatus 20 includes a frame 21 having companion side walls 22 and 22', one of which is shown in FIGS. 8 and 9 at 22. Fore and aft transverse structural members 23 and 24 span between the side walls 22–22' to provide a box-like base 25 for the apparatus. Intermediate bracing similar to the side walls 22–22' may be provided as the width of the machine is increased as required.

A feed table 26 extends forwardly from the frame 21 at counter height on cantilever beams 27 having their aft ends secured to the respective side walls 22–22' at a tower section 28 thereof. A squaring and cutting unit 30 is located at the discharge end of the feed table 26 just ahead of the tower section 28.

The tower section 28 includes a pair of channel members 31 and 31' one adjacent each of the side walls 22 and 22' of the frame 21 as best seen in FIG. 3. Suitable cross bracing 33 and 34 (FIG. 15) extend between the channels 31 and 31' as do guide rolls 35 mounted on a shaft 36 the ends of which are journaled in bearings 37 supported on the channels 31–31'. The bearings 37 are spring loaded to urge the shaft 36 and rolls 35 downwardly toward multiple strands of feed belts 38'. As best seen in FIGS. 8 and 9 downward movement of the rolls 35 is limited so as to stop in spaced relation to belts 38' where these belts 38' are trained around drive wheels 40' and pulleys 40 in the drive margins. The pulleys 40 are mounted in spaced relation and secured to a shaft 41 having its ends journaled in suitable bearings 41' (FIG. 9) mounted on plates 32 secured to the side walls 22 and

22' of the frame 21 and at intermediate walls thereof when required.

Drive belts 39 are likewise trained around the outside drive pulleys 42 mounted on and secured to the drive shaft 43 for rotation therewith. The drive shaft 43 is journaled adjacent its ends in bearings 43' (FIG. 9) mounted on side plates 32–32' secured to side walls 22 and 22', respectively, of the frame 21. Similar bearings may be provided at intermediate wall members when they are present as required. The two shafts 41 and 43 are thus fixed relative to the frame 21 and with respect to the guide rolls 35 which are directly above the admittance pulleys 40' to constitute with belts 38' a material guiding means F. The drive shaft 43 has its ends extending slightly beyond the outside drive pulleys 42 to receive pulleys 45–45' (FIG. 1) above pulleys 46 and 46' on a main line shaft 47 which extends across the entire frame 21 and has support in suitable bearings at the side walls 22 and 22' thereof as well as any of the intermediate structural wall members. A belt 48 trained around pulleys 45–46 and 45'–46' cause the drive shaft 43 to be turned in unison with the main line shaft 47. The main line shaft 47 also has a drive pulley 49 secured thereto which by belt 50 is drivingly connected to a pulley 51 secured to the shaft of a motor M (FIG. 2).

Another pulley 52 (FIGS. 1 and 2) secured to the main line shaft 47 is drivingly connected by a belt 53 to a pulley 54 on an auxiliary shaft 55 journaled in bearings on the frame 21 beneath the discharge end of the feed table 26. The auxiliary shaft 55 has a clutch 56 thereon for controlling its drive connection to a pulley 57 connected by a belt 58 to a pulley 59 secured to a shaft 60 on the discharge end of the feed table 26. This shaft 60 has multiple pulleys 61 secured thereto at half unit spacings as shown in FIG. 1. Another set of pulleys 62 at the receiving end of the feed table 26 (FIG. 2) have drive connection via belts 63 with the pulleys 61 so that multiple traction is provided at the half way divisions of the units of width to transfer sheet material in flat condition along the feed table and between the guide rolls 35 and the first set of feed belts 38' of the material guiding means F.

Beyond the guide rolls 35 and the feed belts 38' is a yardage rollup mechanism 65 by which the flat material Y is drawn along and turned back upon itself and caused to coil up into a roll. This mechanism 65 comprises a series of segment-like feed sections 66, 67, 68 and 69 driven in unison with the feed belts 38' to have frictional contact sufficient to draw the material into the roll up mechanism. The last and penultimate segments 69 and 68 are fixed at an obtuse angle relative to each other, the penultimate segment 68 being pivotally connected to the intermediate segment 67 and it to intermediate segment 66 which in turn is pivotally connected to the end of the material guiding means F. The overall picture, as best seen in FIGS. 4 through 9 inclusive, comprises a structure simulating the segmented tail section of a Scorpion wherein the segments 66, 67, 68 and 69 are adapted to be initially curled back over the strands of feed belts 38' to cause the incoming flat material Y to be turned back upon itself. In combination therewith the last segment 69, in place of a stinger tip, has a material deflector 70 associated therewith for diverting the leading edge *e* of the incoming yardage Y into its first convolute to form the core of the roll of material to be built up upon the roll up mechanism 65 (FIGS. 8 and 15).

Referring to FIGS. 8 and 9 the roll up mechanism 65 is mounted on a stationary extension 71 of each of the side plates 32–32' of the material guiding means F which consists of the first set of feed belts 38', their pulleys 40'–42' and the guide rolls 35. This stationary extension of the guiding means F also includes a shaft 72 journaled at its ends in bearings 73 on the plates 71. The extension also includes a set of pulleys 74 offset from but adjacent the pulleys 40–42 and drivingly connected to the shaft 43 by means of a pulley 75 secured to the latter and a belt 76 trained around the pulleys 74 and 75. As seen in FIGS. 2, 8 and 9 there is a slight decline in the upper reaches of the belts 76 so that the incoming material Y will tend to be downwardly directed after leaving the initial reaches of the feed belts 38' of the material guiding means F.

Each of the intermediate segments 66, 67 is similar in construction and like parts of each will therefore be designated by like reference numerals. Each intermediate segment 66 and 67 includes a pair of side plates 66' and 67', respectively, at each side of the roll up mechanism 65. These plates 66'–67' support bearings 78–78' adjacent their ends for a pair of shafts by which the segments are linked together by a pivotal jointing afforded by the several shafts. The first bearings 78 are mounted on the previously mentioned shaft 72 which is journaled in the bearings 73 on the ends of the stationary extension of the guiding means F to thereby provide a stationary pivotal mounting for the first joint of the segmented roll up mechanism 65. The after bearings 78' on plates 66' have pivotal connection with a shaft 79 also pivotally connected to the forward bearings 80 on the second segmental plates 67'. The after bearings 81 on plates 67' support a shaft 82 which likewise has pivotal connection with the forward bearings 83 on the third or penultimate segment 68 of the roll up mechanism 65.

The third and last segments 68–69 are parts of common side plates 85 of dogleg shape so that the segments 68 and 69 are disposed at a fixed angle with respect to each other, the final or tail segment 69 being inclined at an obtuse angle with respect to and upwardly from the penultimate segment 68.

As best seen in FIGS. 2, 7 and 9 the roll up mechanism 65, when opened up, is adapted to have the side plates 66' and 67' of its intermediate segments 66 and 67 inclined in alignment with the upper flight of belts 76 on the declining extension of the guide means F. In this condition the side plates 66' and 67' rest upon upstanding legs 66'' and 67'', respectively, which are part of the stationary frame 21.

The side plates 85 which support the penultimate segment 68 and its counterpart 69 are likewise adapted to be supported in open condition upon the frame 21 as shown in FIGS. 2, 7 and 9. However, here it should be noted that although the bearings 83 at the fore end of the segment 68 are aligned with the declining arrangement of the bearings of the segments 66 and 67, the bearings 86 at the knee of the dogleg shaped plates 85 are disposed slightly below that line of decline. This puts a further drop in the tail end of the rollup mechanism 65 for reasons later to be made apparent.

At the very end of the last segment 69 a pair of bearings 87 are secured one to each of the respective dogleg shaped side plates 85 so that a line struck from the center of the bearings 86 at the knee thereof to this last set of bearings 87 is parallel to the angular disposition of the last segment 69 with respect to the penultimate segment 68 (see FIG. 9).

A shaft 88 extending across the tail end of the roll up mechanism 65 has its ends journaled in the bearings 86 and another shaft 89 having its ends journaled in the bearings 87 likewise extends across the mechanism 65.

The outer ends of all of the transverse shafts 72, 79, 82, 88 and 89 extend beyond their mounting plates 66', 67', 68' and 69' into the drive margins of the apparatus as illustrated in FIG. 1. As previously explained, the drive shaft 43, which is driven by interim belt and pulley connection to the motor M, likewise has drive connection with the shaft 72 via drive pulleys 75–74 and belts 76. Power from the drive shaft 43 is likewise transmitted to each of the shafts 79, 82, 88 and 89 by the following arrangement: Shaft 79 has drive pulleys 90 secured thereto which are driven by belts 91 trained around pulleys 92 secured to the shaft 72; the shaft 82 has pulleys 93 thereon for drive connection via belts 94 trained around pulleys 95 secured to shaft 79; the shaft 88 has pulleys

96 secured thereto drivingly connected by belts 97 to pulleys 98 secured to shaft 82; and in like manner, pulleys 99 secured to shaft 88 are drivingly connected by belts 100 to pulleys 101 secured to the transverse shaft 89 at the very end of the roll up mechanism 65.

As best seen in FIG. 1 the alternate sets of drive belts and their pulleys are offset relative to each other lengthwise of the machine 65. Note that drive belts 100 and 94 are aligned with the belt 76 all of which are offset relative to aligned belts 97, 91 and 39 at both sides of the machine. In this manner all of the belts and their shafts are driven in unison and unidirectionally from the drive shaft 43.

Between the drive margins of the apparatus (FIG. 1) and within the confine of the shaft supporting segmental plates 66', 67' and 68'–69' are material supporting belts and pulleys comparable to the drive belts and pulleys already explained. These material supporting belts and pulleys are identified in the drawing by reference numerals corresponding to the drive belts and pulleys but with prime exponents. These material supporting pulleys and belts are similar in construction to the drive belts and pulleys and distinguish only insofar as the drive belts having a partial V shaped center bead V which press fits into a V groove in the drive pulleys as shown in FIG. 10 to keep them aligned with each other. The drive belts also have reinforcing steel cables C embedded therein to assure proper tensioning. The drive belts and pulleys, however, have tooth and notch interlocking surfaces as illustrated in FIGS. 10 and 11 whereas such interlocking is unnecessary in the case of the material supporting belts and pulleys, as is illustrated in FIG. 14. As shown in FIG. 14 the material supporting pulleys need no reinforcing cables and since these belts have a complete center groove G which embraces the perimeter of their associated pulleys, no V shaped center beads are needed on the material supporting pulleys.

At this point reference is made to FIG. 12 to illustrate that the pulleys 61–62 and belts 63 are identical in structure to the material supporting pulleys and belts as just explained. In the case of heavy woven material, such as carpeting a spiked clip 105 as shown in FIGS. 12 and 13 is advisable for drawing such heavier sheet material along the feed table 26. However, once such material enters between the belts 38' and the guide rollers 35 of the material guiding means F the material is drawn over the material supporting belts. The material supporting belts move at the same rate of speed as the incoming material whereby friction between the material and the belts of the roll up mechanism 65 cause the material to move with the belts. Consequently, it will be appreciated that the material supporting belts will guide and deflect the material into a coil or roll during the entrance of the leadings edge *e* of such material into the roll up mechanism. However after a sufficient amount of material has been rolled up within the mechanism 65 the weight of such roll resting upon the moving material supporting belts will cause the latter to transmit movement to the roll of material being developed. The weight of the roll so developed also serves to open up the Scorpion-like mechanism 65 which as stated earlier is adapted to be initially curled back upon itself. Means 106 for initially curling the segments 66, 67 and 68–69 back into material receiving condition will now be explained.

The means 106 comprises an electric motor 107 controlled separately from the motor M and drivingly connected by a belt and pulley drive 108 to a counter shaft 110 for driving the latter. The countershaft 110 is journaled in bearings (not shown) supported on the frame 21 so as to extend across the latter whereby the ends of the shaft 110 extend beyond the drive margins of the frame. Each end of the countershaft 110 has a gear 111 mounted thereon and drivingly connected thereto via a friction, slip clutch 112, the hub of which is secured to the countershaft 110 (FIG. 17). Also mounted on each end of the countershaft 110 is a stirrup 113 having a pair of rollers 114 thereon for supporting a rack bar 115 in driving engagement with the adjacent gear 111.

The upper end of each rack bar 115 has pivotal connection as at 109 with a pair of link bars, one pair 116 of which has pivotal connection with the ends of the transverse shaft 79 and the other pair 117 having pivotal connection with the ends of the shaft 88 at the knee of the tail end of the segmental roll up mechanism 65.

The arrangement is such that when the electric motor 107 is energized, and the roll up mechanism 65 empty, the countershaft 110 turns the clutches 112. The slip clutches 112 frictionally drive the gears 111 to force the rack bar 115 in a rearwardly and upwardly direction from the position shown in FIG. 2 to that of FIG. 4. The axis of the countershaft 110 is so disposed relative to the axis of shaft 72, which is the pivotal axis of the first segment 66, as to elevate all of the segments off of the supporting frame 21. By the same token since the rack supporting stirrup 113 is adapted to turn about the countershaft 110 upon which it is mounted, the rack bar 115, being connected to the shafts 79 and 88, will follow the curling action of the several segments until the shaft 88 on the last segment 69 reaches an over center relation to the pivotal connection 109 of the endmost link bar 117 with the rack bar 115 (FIG. 4). Thus it will be seen that the weight of the tail plates 85 and the shafts, pulleys and belts thereon serve to maintain the Scorpion-like roll up mechanism in coiled back position as shown in FIGS. 4 and 8.

In addition thereto it should be noted in FIGS. 1 and 8 that the several segments 61, 67 and 68–69 have limit means L thereon whereby to prevent each set of mounting plates thereof on both sides of the machine from folding back upon a preceding plate beyond a predetermined angular disposition relative thereto. As best seen in FIG. 8 the several plates 66, 67 are limited against swinging beyond an angular disposition relative to the adjoining plates 68 and 71 which angular disposition is comparable to the fixed obtuse angle between the last and penultimate portions 68 and 69 of the dogleg plates 85.

Referring to FIGS. 8 and 9 as well as FIG. 1 the limit means L between adjacent segments on each side of the machine comprises three loop straps 121, 122 and 123 and a plurality of pins 124, 125, 126, 127 and 128 each adapted to extend into the slot provided by the loop straps. Each pin 124 through 128 is provided with an enlarged head H and the pins 124 are secured to the respective stationary extensions 71 beneath the shafts 72 to support the loop strap 121 adjacent the inner sides of the plates 71. The pins 125 are secured to and midway the ends of the plates 66', through the same and are double headed as seen in FIG. 1 to support the loop strap 121 adjacent the inside thereof and the loop strap 122 on the outer side thereof. The pins 126 are secured to the plates 67' beneath the shaft 79 supported thereon so as to support the loop strap 122 adjacent the outer sides of plates 67'. Pins 127 are secured to the outer sides of plates 67 adjacent the ends thereof and pins 128 are secured to the outer sides of plates 85 substantially midway of and beneath the shafts 82 and 88 so that both pins 127 and 128 are slidably arranged relative to and within the slot provided by the loop strap 123 on each side of the machine.

The loop straps 121, 122 and 123 are thus supported between the headed ends H of their respective pins and the plates from which the pins extend. Each loop strap is of such length as to limit further swinging movement of the respective plates toward each other when each of the two pins associated with a particular loop is lodged in the end bights of the latter.

Referring to FIGS. 8, 15 and 16 the stinger tip of the Scorpion-like segmental structure includes the material deflector 70 now to be explained. This material deflector 70 is normally retracted within the reaches of the belts 100' of the last segment 69 but is constructed to extend

beyond the roll supporting reach of belt 100' when the segment 69 is disposed in its curled up position (FIG. 15). This involves a spring loading of the deflector 70 which normally retracts the same and a trip mechanism set into operation upon arrival of the segment 69 in its curled up position.

There are several deflectors 70 provided across the width of the roll-up mechanism, two being shown in FIG. 1 adjacent each side thereof in the drive margins. Each deflector 70 comprises a steel strap 130 having one end bent back upon itself to provide a loop 131 about the penultimate shaft 88 and over a nylon bushing 132 thereon and between a pair of collars 133 secured thereto. The loop 131 is approximately one half the length of the strap 130 the opposite end of which terminates a curved lip 134 providing an arcuate segment of lesser radius than the inner reaches of the belts of the coiled up segmental units 66–67 and 68–69. Moreover when the deflector is extended into operative position beyond the inner reach of the belts 100', the arcuate segment of the curved lip 134 has its terminal ends above and below the center of the arc of radius about which the arcuate segment is struck to turn the leading edge *e* of the material downwardly and rearwardly.

This assures that the leading edge *e* of the incoming yardage Y will be directed into a coil to form the first or core convolute of the newly formed roll of material. The strap 130 has a nylon facing 135 thereon where it is engaged by the oncoming material so as to provide a smooth surface having a minimum of surface friction relative to the material being rolled up and to minimize wear of the strap 130 in that bearing area.

The opposite (back) face of the strap 130 has a pair of trunnion ears 136 projecting therefrom which support a cross pin 137 upon which a pair of upstanding ears 138 of a trip lever 139 are pivotally mounted (see FIG. 16). The trip lever 139 is bent midway at an obtuse angle around a nylon bushing 140 which is secured by suitable cement to the lever 139 and is mounted on the endmost shaft 89 of the roll up mechanism 65.

The trip lever 139 has a coil spring 141 associated therewith and mounted on the cross pin 137. One end of this spring 141 bears against the back face of the strap 130 and the other end of spring 141 bears against the back face of the trip lever 139. This spring 141 normally tends to urge the eared end of the curved lip 134 into engagement with a foot 139' on lever 139 and into parallel alignment with the back face of the strap 130 (dot-dash position FIG. 15). In this position the loop 131 slides upwardly relative to the nylon bushing 132 on the shaft 88 and the curved lip 134 of the deflector 70 is retracted to a position within the confines of the reaches of belts 100' at all times other than when the last segment 69 is in fully curled up condition.

The opposite (free) end of the trip lever 139 has an outwardly opened hook 142 formed thereon to engage a like hook end 143 of a solenoid 144 pivotally mounted as at 145 on a bracket 146 extending rearwardly from the tower 28. The hook 143 is mounted on one end of the armature core 147 of the solenoid 144 and is normally down in a position to be engaged by the hook 142 on the trip lever 139. However, when the coil of the solenoid 144 is energized the core 147 is pulled upwardly to swing the hooked end 142 of the trip lever (clockwise FIG. 15) about the axis of the shaft 89. This swings the opposite end of lever 139 in a like direction and with it moves the cross pin 137 down to pull the strap 130 downwardly whereby the bight portion of the loop 131 formed thereon will become a fulcrum and strap 130 thereby will swing about the shaft 88 upon which it is mounted.

It will thus be seen that the strap 130 is caused to swing out against the action of the spring 141 and away from parallel alignment with the eared end of the trip lever 139, the latter acting as a strut between the shaft 89 and the curved end 134 of the strap 130 to dispose the latter in operative, extended position to engage the leading edge *e* of the oncoming sheet material Y.

The coil of the solenoid is in an electrical circuit 148 including a switch 149 which may be manually or automatically operated as desired, to maintain the deflector 70 in operative (extended) position during the first or initial turn of the material Y within the roll up mechanism 65. Once the center coils of a roll have been formed in the material Y the switch 149 may be opened to release the core of the solenoid 144. Thereupon the spring 141 will take over and retract the deflector 70 out of operative position.

The roll R of yardage material Y is now completely confined within the curled up segments of the roll up mechanism 65 and bearing against the inner reaches of the material supporting belts 91', 94', 97' and 100' thereof which are turning unidirectionally with the yardage material being guided in at the guide means F (belts 38' and rollers 35). As the roll R builds up within the curled up segments 66–67, and fixed segments 68–69 the segments are free to open up by expansion of the roll R (FIG. 6). Meantime, however, the slip clutch 112 is maintaining the gear 111 associated therewith in rack extending position but the inward pressure of the roll R bearing outwardly on the supporting belts 91', 94', 97' and 100' of the segments being greater than the surface tension in the slip clutch 112, the latter gradually yields until the roll R becomes of great enough weight and diameter to open up the segments 66, 67 and 68–69 to their other limit of movement, i.e., at rest upon the supports 66'', 67'' and the after end of the frame 21. In this position it will be noted that the last and penultimate segments 69 and 68 being at a fixed angle relative to each other, their support belts 97' and 100' provide a trough-like support for the roll R for maintaining the latter upon the after end of the roll up mechanism 65. The roll R thus formed is self tightening due to its being built up from the outside in, its own weight tending to cooperate with the advancing feed and support belts to firmly wrap the material Y about itself.

At this stage it should be noted that the speed of the belts of the roll up mechanism is constant and although the perimeter of the roll R increases circumferentially no change of speed at the core thereof is required as would be the case if the roll R were being developed from the center outward as by a shaft or pole. However, after the roll R is completed a pole or shaft may be inserted through the core thereof if desired for lifting and carrying the completed roll.

Before the roll R can be removed, unless a terminal end thereof has passed the guide means F, the yardage Y must be cut to provide a terminal end. This is accomplished by the previously mentioned cutting unit 30 now to be explained in conjunction with FIGS. 1, 3 and 15.

The cutting unit 30 comprises a double edged knife in the case of carpeting and other fabrics. In the case of metal a double edged saw would be used. In the present case it is a dual edged knife 150 which extends upwardly through a transverse slit 151 in a bridge portion 152 between the feed table 26 and the forcing means F. This double edged knife 150 is mounted on a dolly 153 the wheels of which ride upon a track 154 supported directly beneath the slit 151 and between the side walls 22–22' of the frame 21. The dolly 153 is secured to a flexible link belt or chain 155 trained around sprockets 156, 157, 158 and 159 suitably journaled in the frame 21. The sprocket 159 is secured to the drive shaft of a reversible motor 160 mounted on the frame 21. Limit switches 161 and 161' are disposed at each side wall 22 and 22' of the frame 21 for engagement by the dolly 153 as it reaches the drive margin at either side of the apparatus at the end of a cut. The knife 150 or saw, as the case may be, may be caused to vibrate, i.e., reciprocate up and down by any convenional means in the dolly 153.

After a specified number of feet of material Y has been fed beyond the cutting slit **151** as determined by a meter **162** associated with the clutch **56** on the feed table **26**, the attendant grasps the handle **183** of a lever **184** at either side of the apparatus and pulls the lever down (clockwise FIG. 15). The lever **184** is secured to a shaft **185** journaled on bearings **186** on the tower **28** and extends across the forward side thereof for connection with the lever **184'** on the opposite side of the machine. The lever **184** is thus pivotally connected to the tower **28** by means of the shaft **185**. Also secured to the shaft **185** is a set of rocker arms **168** having their opposite ends pivotally connected as at **187** to a press bar **170** which has its upper end pivotally connected to an arm **168'** comparable to the rocker arm **168** and pivotally connected to another bracket ear **169'** likewise extending forwardly from the tower **28** to maintain the press bar **170** in parallelism therewith and vertically disposed.

The lower end of the press bar **170** has a channel shaped bottom rail **171** which extends all the way across the apparatus and has its open bottom disposed to swing into a position to overlay the path of the double edged knife **150**. The two flanges of the channel **171** straddle the path of the knife and their lower edges bear firmly down upon the sheet material Y on either side of the slit **151**.

The press bar **170** is spring loaded by a toggle arrangement at the ends of the tower **28** including tension springs **172'** each having one end anchored to the respective side channel **31–31'** of the tower. The springs **172'** each have their anchored end disposed horizontally opposite the pivotal connection of rocker arm **168** with the ear **169**, and its opposite end connected to the pivoted end of the rocker arm **168** so as to create an over center action between the up and/or down limits of movement of the arm **168**.

From the foregoing it will be appreciated that when the press bar **170** is lowered, the springs **172'** urge the bottom edges of the channel **171**, which may be serrated, into contact with the yardage material Y to firmly hold the same closely adjacent to the path of the knife **150**. It should be here noted that the yardage material Y being aligned with the longitudinal axis of the feed table and roll up mechanism, the path of the knife **150** is square to the length of the material. Consequently, when the switch to the reversible motor **160** is turned on, the dolly **153** is caused to move from one side of the frame to the other along the slit **151** and between the flanges of the channel **171**. The material is thus cut square to the length. The limit switches **161–161'** are of the dual circuit type so that when the dolly **153** engages one of them, say **161'**, to stop the motor **160** it also sets up the other circuit for operating the motor **160** in reverse direction for the next cut to be made.

When the cutting is complete, the lever **183** is again swung up (from dotted to full line position FIG. 15) to raise the press bar **170** away from the feed table. A plurality of deflectors **175** have their upper ends secured to a shaft **165** extending across the top of the tower **28** and journaled in ears **166** spaced along the same. At each end of the tower **28** a lever **164** is connected to the end of the shaft **165** and has an over center spring **172** associated therewith to rock the shaft **165** and deflectors **175** between two extreme positions. Each lever **164** has a handle **163** for manipulating the same. The deflectors **175** are normally disposed out of the way of the presser bar **170** and channel **171** during the cutting operation. However, when the material is to be fed the deflectors **175** have their curved lower ends **176** disposed below the raised presser bar **170** in a position to deflect the leading edge *e* of oncoming material toward the lower quadrant of the guide rolls **35**. The rolls **35** moving anticlockwise FIG. 15 will thus force the leading edge *e* of the material into the force means F for movement thereby.

Summary of operation

The Scorpion-like segmental roll up mechanism **65** is first curled back upon itself by operation of the motor **107**. The leading edge *e* of the material to be rolled up is first set at the path of the knife **150** and the meter **162** on the feed table **26** is set at zero. The deflectors **175** are then set into a position with their curved lower ends **176** adjacent the guide rolls **35** to deflect the leading edge *e* into the material guiding means F in the event the leading edge *e* of the material Y should tend to curl upwardly from the surface of the feed table. Should the leading edge *e* curl downwardly, note in FIG. 15 that the edge **190** of the slit **151**, through which the knife travels, is rounded so as to guide the edge *e* onto the surface of the bridge portion **152**, the upper surface of which is aligned with the belts **38'** of the material guiding means F.

Motor M is next set into operation to cause all the pulleys and belts on the roll up mechanism to turn unidirectionally. Next the clutch **56** on the shaft **55** controlling the feed table pulleys and belts is engaged to drive the latter.

The yardage material Y now moves toward the guiding means F and the leading edge *e* caused to enter between the belts **38'** and guide rolls **35**. The material Y is thus brought into the roll up mechanism **65**, the leading edge *e* of the material following the inner reaches of the material supporting belts **76'**, **91'**, **94'**, **97'** and **100'** which are confined to a radial disposition within the curled back segments of the roll up mechanism **65**. The switch **149** being closed has caused the deflector **70** to be extended into operative position FIG. 15 to thereby deflect the leading edge *e* downwardly toward the top surface of the incoming material Y. The leading edge *e* is thus drawn by the incoming material into a first convolute of the roll R to be formed.

As the roll R continues to build up it increases in diameter and in weight to force the curled back segmented roll up mechanism **65** to gradually open up against the action of the friction clutch **112**. The slight decline in the support belts **76'** and **91'** (FIG. 6) causes the heavier developing roll R to gravitate rearwardly and continues to do so as support belt **94'** aligns with belts **76'** and **91'**. Finally the roll R rests with its outer or peripheral layer tangently supported in the trough-like disposition of the last segment **69** relative to the penultimate segment **68** and preceding ones (see FIG. 17).

When the desired length of material Y has been rolled up as determined by a reading of the meter **162** the motor M is shut off. The deflectors **175** are moved out of the way and the press bar **170** is now lowered by operation of the lever **183** on either side of the apparatus to press the channel shaped bottom rail **171** into engagement with the material Y. The cutting knife **150** is now caused to travel transversely of the machine by operation of motor **160** to cut the material Y square to the length.

If the roll R of material is to be wrapped in paper or the like such wrapping is fed into the force means F above the terminal end of the material Y which has just been cut. Now by turning on motor M the wrapping is drawn in with the material Y and firmly rolled around the roll R until it is completely wrapped. Thereafter the wrapped roll R may be tied with cord, tape or any other media before being lifted off of the roll up mechanism **65**.

A reverse operation may be employed to feed out carpeting or any other yardage being handled. In other words a roll of material Y may first be placed upon the roll up mechanism in the manner shown in FIG. 2. The motor M can then be operated in a reversed direction so that the terminal end of the material in the roll will pay out over the belts back through the material guiding

means F which will then guide the material out and onto the feed table 26. In this manner the yardage material can be dispensed, measured and cut for specific jobs, customers orders or for purposes of inventory. Such reversed operation may be from one roll up mechanism to another so that the measured quantity is rerolled immediately.

It should here be noted that the weight of the rolled up material will keep the roll R tightly rolled by reason of its support in the trough-like terminal segments of the roll up mechanism 65. Moreover, as the roll R diminishes in size and weight, the friction clutch 112 is constantly working to curl the segmented roll up mechanism back upon itself to keep the roll R under tension and the material thereof tightly wrapped about itself.

Another feature of the apparatus of the instant application is that it can be used to roll up material, either side out if required. This may be done by placing a roll on trunnions or the like at the end of the feed table (left end FIGS. 1 and 2). Then drawing the material up and over the front set of pulleys 62 and belts 63 with the finished side of the material down and rough side up, upon the table 26.

The apparatus is useful at the mills such as wallpaper or cloth printers and especially at the looms where carpeting is being woven with a pattern on its finished face. Such patterns are usually repeated in units of length of the yardage coming from the loom. Heretofore such patterned material coming from a press or a loom was rolled up on a pole, tube or shaft which was drivingly connected to some form of mechanism for turning the same. As the diameter of the roll of material increases on such shafts, poles or tubes, the speed of the latter must be stepped down to one commensurate with that of the material coming out of the press or loom. This is not a gradual stepping down of speed but an abrupt one at intervals reasonably timed to the increased outside diameter of the roll of material on such shaft, pole or tube. Consequently, as each interval nears the time for stepping down the speed of the roll of the material a greater degree of stretching of such material occurs. This results in a stretching out of each pattern on the material making such units of pattern unmatchable with the normal intended length of a unit bearing a pattern.

The device of the present invention overcomes such deficiencies experienced with prior roll up mechanisms. With the roll up mechanism of the present invention material can be drawn from a loom or a press at a fixed, constant speed so that each unit of length of pattern will match that of any other for the entire output of the loom or press.

While I have described my yardage combine in specific detail it will be appreciated by those skilled in the art that the same may be susceptible to variations, alterations and/or modifications without departing from the spirit of my invention therein. I, therefore, desire to avail myself of all variations, alterations and/or modifications which may fairly come within the purview of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. A yardage combine comprising a feed table for feeding flat continuous sheet material thereover, a roll up mechanism having guide means at its receiving end for receiving sheet material from said feed table and for guiding said material into said roll up mechanism, said roll up mechanism including a plurality of material conveying intermediate segments and a penultimate segment linked together for swinging movement back upon themselves, and a terminal segment fixed relative to said penultimate segment for providing a trough-like roll retainer when said roll up mechanism is disposed in opened condition, means for limiting such swinging movement of said segments back upon themselves whereby all of said segments are confined to a substantially radial disposition relative to each other, a normally retracted deflector on said terminal segment, means engageable by said deflector upon arrival of all of said segments at their limit of swinging movement into radial disposition for extending said deflector into the path of the oncoming material for rolling said material upon itself from the inside out, and tensioning means for releasably holding said segments in said confined radial disposition and for gradual opening by said roll of material as it builds up.

2. A roll up mechanism for continuous lengths of matted, meshed, pressed and the like plyable sheet material comprising a pair of fixed side walls, a plurality of pairs of intermediate segmental side walls, a pair of last and penultimate side walls fixed at an obtuse angle with respect to each other, a shaft journaled between each of said fixed side walls, said intermediate segmental side walls and the penultimate side walls for pivotally connecting them together, the last and penultimate ones of said segmental side walls being of a dog-leg shape and having a shaft extending between each angle and each end thereof for providing a fixed, trough-like zone at the terminal end of said roll up mechanism, a plurality of pulleys on said shafts, material supporting belts trained around said pulleys for supporting said sheet material on the upper reaches of said belts and for moving said sheet material along the upper reaches of said material supporting belts, means for driving said shafts in unison and the upper reaches of said belts unidirectionally, and means for releasably urging said segmental side walls back upon themselves for initially disposing the upper reaches of said belts into a substantially radially arranged disposition for curling said sheet material into a roll.

3. A roll up mechanism for continuous lengths of matted, meshed, pressed and the like plyable sheet material comprising a frame, a pair of fixed side walls on said frame, a plurality of intermediate pairs of segmental side walls, a shaft journaled between each of said fixed side walls and said intermediate segmental side walls for pivotally connecting them together, a pair of last and penultimate segmental side walls fixed at an obtuse angle with respect to each other and having a pair of shafts extending between them, one at the end and the other at the angles between said penultimate and last segmental side walls, a shaft for pivotally connecting the ends of the penultimate segmental side walls to the end of one of said intermediate segments, to provide a trough-like zone at the terminal end of said roll up mechanism, means on said frame for supporting said intermediate segmental walls in substantial alignment with each other, a plurality of pulleys on all of said shafts, material supporting belts trained around said pulleys for supporting said sheet material on the upper reaches of said belts for moving said sheet material onto the upper reaches of said material supporting belts, means for driving said shafts in unison and the upper reaches of said belts unidirectionally, and friction means for releasably urging said segmental side walls back upon themselves for initially confining the upper reaches of said belts in substantial radially array for curling said sheet material into a roll and for maintaining said roll of material under friction as said segmental walls are gradually urged toward substantial alignment with each other.

4. A roll up mechanism for continuous lengths of matted, meshed, pressed and the like plyable sheet material comprising a pair of fixed side walls, a plurality of pairs of intermediate segmental side walls and a pair of terminal side walls in the form of last and penultimate segmental portions comparable to said intermediate segmental side walls but fixed at an obtuse angle relative to each other, a shaft journaled between each of said fixed side walls, said intermediate segmental and said terminal side walls for pivotally connecting them together, means for supporting said segmental side walls in a declining disposition from said fixed side walls, a pair of shafts journaled on said terminal side walls, one at the juncture of the penultimate and last segmental portion

and one at the end of the latter for providing a trough-like zone at the terminal end of said roll up mechanism, a plurality of pulleys on each of said shafts, material supporting belts trained around offset sets of said pulleys for supporting said sheet material on the upper reaches of said belts, material guiding means arranged between said fixed side walls for guiding said sheet material onto the upper reaches of said material supporting belts, means for driving said material guiding means, said shafts and the upper reaches of said belts unidirectionally, lifting means between said means for supporting and said terminal side walls for urging said intermediate segmental and terminal side walls back upon themselves whereby the upper reaches of said belts deflect and curl said sheet material into a roll, and friction means associated with said lifting means whereby the roll of material being developed gradually forces said belts and segmental walls to open condition upon said means for supporting said intermediate segmental side walls.

5. A roll up mechanism for continuous lengths of matted, meshed, pressed and the like plyable sheet material comprising a frame having a pair of fixed side walls, a plurality of sets of intermediate segmental side walls and a pair of terminal side walls in the form of last and penultimate segmental portions fixed at an obtuse angle relative to each other, a shaft journaled between said fixed side walls and each set of said intermediate segmental and terminal side walls for pivotally connecting them together, a pair of shafts rotatably mounted between said terminal side walls, one at the angle between the penultimate and last segmental portions and one at the ends thereof, a plurality of pulleys on all of said shafts, material supporting belts trained around each set of said pulleys for supporting said sheet material on the upper reaches of said belts, material guiding means for guiding said sheet material onto the upper reaches of said material supporting belts, means for metering and feeding said material to said material guiding means, means for driving said metering, feeding, material guiding means and said shafts in unison, means on said frame for supporting said intermediate segmental side walls in a declining disposition from said fixed side walls, the last and penultimate segmental portions of said terminal side walls being of a dog-leg shape for providing a fixed, trough-like roll supporting zone at the terminal end of said roll up mechanism, and means for releasably urging said terminal and intermediate segmental side walls back upon themselves whereby the last and penultimate portions of said terminal side walls overlie the intermediate segmental side walls to thereby dispose the upper reaches of said belts into a scroll forming disposition for curling said sheet material into a roll and for gradual opening of said segmental and terminal side walls toward said declining disposition by expansion of said roll of material.

6. A roll up mechanism for continuous lengths of woven, matted, meshed, pressed and the like plyable sheet material, comprising material conveying segments including a shaft at each end of said segments for pivotally connecting them together, a plurality of pulleys on each of said shafts, a belt trained around offset sets of said pulleys, said belts having their upper reaches disposed to support and move said plyable sheet material thereover, one of said segments being fixed, a material guiding means on said fixed segment for guiding said sheet material over the upper reaches of said belts, said segments being normally disposed in open condition at a declining angle relative to said material guiding means, a pair of terminal side walls in the form of last and penultimate segmental portions arranged at a fixed obtuse angle relative to each other and including a pair of shafts, one at the angle and the other at the end of said last segmental portion for providing a trough-like roll supporting zone at the end of said roll up mechanism, a shaft pivotally connecting said penultimate segmental portion to that end of said material conveying segments opposite to said fixed segments, means for driving all of said shafts and said material guiding means in unison, means connected to said terminal side walls for elevating the latter and said pivotally connected segments back upon themselves for releasably holding said segments and the last and penultimate segments in a substantially radially arranged disposition for curling sheet material coming from said material guiding means into a roll, and friction drive means on said elevating means whereby said segments yield toward open condition by the expansion of a roll of material built up within said radially disposed segments.

7. A roll up mechanism for continuous lengths of woven, matted, meshed, pressed and the like plyable sheet material, comprising material conveying segments including a shaft at each end of said segments for pivotally connecting them together, a plurality of pulleys on each of said shafts, a belt trained around each set of pulleys, said belts having their upper reaches disposed to support and move said plyable sheet material thereover, one of said segments being fixed, a material guiding means on said fixed segment for guiding said sheet material over the upper reaches of said belts, said segments being normally disposed in open condition at a declining angle relative to said material forcing means, a pair of terminal side walls including a last segment and a penultimate segment fixed at an obtuse angle relative to each other and including a pair of shafts, one at the angle and the other at the end of said pair of terminal side walls, a shaft for pivotally connecting said penultimate portion of said terminal side walls to that end of said material conveying segments opposite to said fixed segments for providing a trough-like roll supporting zone at the end of said roll up mechanism, means for driving all of said shafts and said material guiding means in unison, means connected to said terminal side walls for urging the latter and said pivotally connected segments back upon themselves and for releasably holding the same in a substantially radially arranged disposition, retractable deflectors mounted on the last segments of said terminal side walls, means for engaging said deflectors for extending said deflectors into the path of oncoming sheet material when said segments are urged fully back upon themselves for curling said sheet material coming from said material guiding means into a roll, and a friction drive for said means for urging said segments back upon themselves whereby expansion of a roll of material built up within said radially disposed segments urges the latter toward open condition.

8. A yardage handling apparatus comprising a frame, a roll up mechanism having a plurality of segmental conveyors each including sets of offset belts and pulleys on shafts pivotally connecting said segmental conveyors to each other, a material guiding means mounted on said frame, a shaft for pivotally connecting one end of said roll up mechanism to said material guiding means for receiving and guiding a continuous length of plyable sheet material onto the upper reaches of said belts, the opposite end of said roll up mechanism having last and penultinate segmental conveyor portions fixed at an obtuse angle relative to each other, a shaft for pivotally connecting the penultimate segmental conveyor portions to the adjacent ones of said segmental conveyors to provide a roll supporting trough when said roll up mechanism is opened up and supported on said frame in a declining disposition relative to said material guiding means, a friction drive elevator between said frame and said last segmental conveyor portions for urging the terminal end of said roll up mechanism back upon said segmental conveyors whereby to position the upper reaches of all of the belts thereof in substantial radial array for turning oncoming material into a roll, and a retractable deflector on the last segmental conveyor portions having a lever engageable

by said frame upon arrival of the terminal end of said roll up mechanism back upon said segmental conveyors to thereby extend said deflectors into the path of said material for deflecting the leading edge of said oncoming material into circumferential engagement with that portion of said sheet material supported on the upper reaches of the belts of an intermediate one of said segmental conveyors.

9. A yardage handling apparatus comprising a frame having a material guiding means at one end thereof, a feed table for feeding plyable sheet material to said material guiding means, means for metering the material as it is fed from said feed table into said material guiding means including a guide slot transverse to said frame between said feed table and said material guiding means coordinated with said metering means whereby the latter may be set at zero when the leading edge of said material is aligned with said guide slot, a roll-up mechanism comprising a plurality of intermediate segmental conveyors pivotally connected together and having one end pivotally connected to said material guiding means, said intermediate segmental conveyors being normally supported on said frame in a declining disposition relative to said material guiding means, a terminal conveyor on said roll up mechanism consisting of a last and penultimate segmental portion fixed at an obtuse angle relative to each other, a shaft pivotally connecting said penultimate segmental portion to the opposite end of said intermediate segmental conveyors to provide a roll supporting trough at the terminal end of said roll up mechanism, and friction driven means between said frame and said terminal conveyor for swinging the latter back over said intermediate segmental conveyors to form therewith a substantially circular configurated conveyor for turning oncoming sheet material into a roll and for expansion by said roll as it builds up and returns said segmental conveyors toward normally supported position on said frame.

10. A yardage handling apparatus comprising a frame having a material guiding means at one end thereof, a feed table for feeding plyable sheet material to said material guiding means, means for metering the material as it is fed from said feed table into said material guiding means including a guide slot transverse to said frame between said feed table and said material guiding means coordinated with said metering means for manual setting thereof at zero when the leading edge of said material is aligned with said guide slot, a roll-up mechanism comprising a plurality of intermediate segmental conveyors pivotally connected together and having one end pivotally connected to said material guiding means, said segmental conveyors being normally supported on said frame in a declining disposition relative to said material guiding means, a terminal conveyor on said roll up mechanism in the form of a last and a penultimate conveyor portion fixed at an obtuse angle relative to each other, a shaft pivotally connecting said penultimate segmental conveyor portion to the opposite end of said intermediate segmental conveyors to provide a roll supporting trough at the terminal end of said roll up mechanism, friction driven means between said frame and said terminal conveyor for swinging the latter back over said intermediate segmental conveyors to form therewith a substantially circular configurated conveyor for turning oncoming sheet material into a roll and for expansion by said roll as it builds up and returns said segmental conveyors toward normally supported position on said frame, a cutting blade extending up through said guide slot and normally disposed at one end thereof, and means for alternately moving said cutting blade along said guide slot for cutting said material square to its length after a preselected length of said material has been fed from said feed table according to said means for metering the material.

11. A yardage handling apparatus comprising a frame having a material guiding means at one end thereof, a feed table for feeding plyable sheet material to said material guiding means, means for metering the material as it is fed from said feed table into said material guiding means including a guide slot transverse to said frame between said feed table and said material guiding means coordinated with said metering means for manual setting thereof at zero when the leading edge of said material is aligned with said guide slot, a roll-up mechanism comprising a plurality of intermediate segmental conveyors pivotally connected together and having one end pivotally connected to said material guiding means, said intermediate segmental conveyors being normally supported on said frame in a declining disposition relative to said material guiding means, and a terminal segmental conveyor pivotally connected to the end of said roll up mechanism including penultimate and last segmental portions fixed relative to each other to provide a roll supporting trough at the terminal end of said roll up mechanism, friction driven means between said frame and said terminal segmental conveyor for swinging the latter back over said segmental conveyors to form therewith a substantially circular configurated conveyor for turning oncoming sheet material into a roll and for expansion by said roll as it builds up and returns said segmental conveyors toward normally supported position on said frame, a presser bar mounted on said frame ahead of said material guiding means, means for manually moving said presser bar down upon said sheet material for holding the latter firmly over said guide slot, a cutting blade extending up through said guide slot and normally disposed at one end thereof, and means for alternately moving said cutting blade along said guide slot for cutting said material square to its length after a preselected length of said material has been fed from said feed table according to said means for metering the material.

12. A yardage handling apparatus comprising a frame, a material guiding means on said frame, a feed table for feeding plyable sheet material to said material guiding means, metering means on said feed table for measuring the material as it is fed into said material guiding means, a guide slot between said feed table and said material guiding means coordinated with said metering means for manual setting thereof at zero when the leading edge of said material registers with said guide slot, a roll-up mechanism having a plurality of intermediate segmental conveyors pivotally connected together and having one end pivotally connected to said material guiding means and normally supported on said frame in a declining disposition relative to said material guiding means, and a terminal segmental conveyor including a last and a penultimate section fixed at an angle relative to each other to provide a roll supporting trough at the terminal end of said roll up mechanism, friction drive means between said frame and said terminal segmental conveyor for swinging the latter back over said intermediate segmental conveyors to form therewith a substantially circular configuration conveyor for turning oncoming sheet material into a roll and for expansion by said roll as it builds up and returns said segmental conveyors toward normally supported position on said frame, means for limiting swinging movement of said terminal and intermediate segmental conveyors back upon themselves, a retractable deflector on the last segmental section of said terminal segmental conveyor, including a lever engageable by said frame upon arrival of said terminal segmental conveyor back upon said segmental conveyors for extending said deflector into the path of the leading edge of said sheet material for deflecting the latter into a first convolute of said roll, a presser bar mounted on said frame ahead of said material guiding means, means for manually moving said presser bar down upon said sheet material for holding the latter firmly over said guide slot when said feed table, material guiding means and said roll up mechanism are stopped, a cutting blade extending up through said guide slot and normally disposed at one end thereof, and means for alternately moving said

cutting blade along said guide slot for cutting said material square to its length after a preselected length of said material has been fed from said feed table as shown on said metering means.

13. A yardage combine comprising a frame, a material guiding means on one end of said frame, a feed table for feeding flat continuous sheet material into said material guiding means, and a scorpion-like roll up mechanism comprising a first conveyor on said frame adjacent said material guiding means, a plurality of intermediate conveyors of substantially equal length pivotally connected together and to the discharge end of said first conveyor, and a tail-like terminal conveyor comprising a last and a penultimate conveyor fixed at an obtuse angle relative to each other and pivotally connected to the discharge end of said intermediate conveyors, means between said frame and said terminal conveyor for releasably urging the latter and said intermediate conveyors into substantial radial array for curling oncoming sheet material into a coil and for gradual opening by the coiling of sheet material so built up, and means on said frame for limiting opening of said roll up mechanism by said coil and for holding said terminal conveyor in trough-like position for supporting the coil of sheet material thereon.

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