This invention relates to machines for making shipping tags, and more particularly to machines of this kind by which the tags are produced from a continuous length of web of material.

The invention has for its object to provide a machine of the kind stated embodying certain novel and improved features of construction and modes of operation as will be pointed out in the detailed description appearing hereinafter, and in order that the same may be better understood, reference is had to the accompanying drawings, wherein:

Figure 1 is a plan view of the machine; Fig. 2 is a central longitudinal section thereof; Fig. 3 is a horizontal section on the line 3—3 of Fig. 2; Fig. 4 is an irregular cross-section on the line 4—4 of Fig. 1; Fig. 5 is a diagram illustrating the operation of certain parts of the machine; and Fig. 6 is a plan view of a fragment of the web showing how the tags are formed.

Referring to Fig. 6 of the drawing A denotes a fragment of a web of tag material out of which the tags B are fashioned. In order to double the capacity of the machine, the web is of such a width that it forms two rows of tags which lie side-by-side. Each tag has adjacent to one of its ends the usual hole C for receiving a tie string, said hole being provided with the customary reinforcing pieces D. The web is cut laterally to form the two rows of tags, and transversely to form the individual tags. The longitudinal cutting line is shown at E and the transverse cutting lines at F. Along the line E the web is punched at regular intervals to produce therein the rectangular holes G, which latter form the diagonal upper corner portions of the tags.

Referring now specifically to Figs. 1 to 5 of the drawings which disclose the mechanism for operating on the web A in the manner described, 10 denotes a suitable base to which the stationary frame members of the machine are bolted as shown at 11. The frame work includes pairs of corner standards 12 and 13 supporting at the top a rectangular open frame 14. A power shaft 15, driven from any suitable source, is positioned along one side of the machine and is provided with suitable bearings 16. On this shaft are fastened pinions 17, 18 and 19 which are in mesh with pinions 20, 21 and 22 on shafts 23, 24 and 25 extending transversely of the machine near the bottom thereof. The shafts 23 and 25 are supported by bearings on the standards 12 and 13, and the shaft 24 is supported by suitable bearings on standards 26 positioned at the sides of the machine and intermediate the ends thereof. On the shaft 23 is a spur gear 27 which is in mesh with a spur gear 28 on a shaft 29. The spur gear 28 is also in mesh with a spur gear 30 on a shaft 31 located above and parallel to the shaft 29, these two shafts extending transversely of the machine and being supported by the standards 12. The standards 13 also support two vertically spaced and parallel cross-shafts 32 and 33 driven by shaft 25 through a spur gear 34 on said shaft and meshing with a spur gear 35 on shaft 32, said gear 35 being in mesh with a spur gear 36 on shaft 33. The lower pair of shafts 29 and 32 are spaced in the direction of the length of the machine and carry longitudinally extending bars 37 which are laterally spaced, one bar being on one side of the machine and the other bar on the other side. The ends of the shafts 29 and 32 are formed with offsets or eccentrics 20 and 32 seating loosely in apertures in the bars 37. The upper pair of shafts 31 and 33 are also longitudinally spaced and carry bars 38 in the same way as the shafts 29 and 32, the eccentrics ends of said upper shafts being shown at 31 and 33. The bars 37 and 38 are parallel. It will be evident from the foregoing that when the shafts 29, 32, 31 and 33 are in motion, the bars 37 and 38 are given an oscillatory motion horizontally or in the direction of their length, and also in a vertical direction, as shown by dotted lines in Fig. 5.

At the front end of the machine is the mechanism for producing the holes C and applying the reinforcing pieces D. The pieces D are punched out of two strips which are fed transversely of the web A, above and below the same, respectively. These strips are of course gummed so that they may be pasted to the web.
The pump casing is shown at 1, supported by the base 2 and having an inlet 3 and an outlet 4. The casing is closed by the head 7 with bolts or studs 8. In the lower part of the casing is a shaft 9 (Figs. 4 and 7) which fits in the casing and head as shown and is held against movement by a set screw (not shown) in the casing end. On the casing end of this shaft is a spider 10 having a bearing 11 and a gear 12 having a bearing 13 in which is an offset 14 against which the gear 12 abuts. This spider and gear are always in engagement (Fig. 2) and both fit closely within the circular portion of the casing where they revolve. The inner portion of the spider is hollow to a depth approximately equal to the width of the face of the gear 12 and is so arranged circumferentially as to be the complement of the gear; that is, the spider conforms in shape to the tooth spaces and is of the same diameter as the gear so that, in effect, the spider acts as a movable wall or sealing means as it closes over the gear in the manner to be described later.

Above the fixed shaft 9 is the power driven shaft 15 which turns in the bearings 16 of the casing and 17 of the head. Fixed to this shaft by the key 18 is another gear 19 adapted to mesh with the gear 12. Also on this same shaft and in engagement with the gear 19 is the spider 20 of similar construction to the spider 10 and having a like relation to gear 19. So far it will be seen that gear 19 will drive gear 12 and that spiders 20 and 10 will revolve with their respective gears and that the effective width of the gear teeth in engagement can be varied by the spiders coming over their respective gears. In order that these movements may be simultaneous, I provide a follower plate 21. This follower fits over a reduced end of the spider 20 and is retained by the nut 22 (Fig. 4); the spider being free to rotate while the follower is stationary. Extending downward, the follower is developed into a hollow portion around the shaft 9 with its outer edge abutting against the lower gear 12 and flush with the inner face of spider 20. Gear 12 is retained against the follower plate 21 by the nut 23 on the bearing 13 which rotates with gear 12 on shaft 9. It will thus be seen that any longitudinal movement of the follower 21 will move the spider 20 over the gear 10 and the gear 12 into the spider 10 to decrease the degree of engagement of the working gears so that—the two spiders fitting closely within the casing—the effective width of the gear faces 24 (Fig. 4) is reduced and may be still further reduced to its minimum shown in Fig. 7 at 24.

When in operation, the internal pressure developed in the pump will act longitudinally against the faces of the spiders and against the exposed area of the follower plate and tend to force the upper spider and the follower plate to their extreme position toward the head 7 and thus keep the gears in their maximum degree of mesh as in Fig. 4 and the pump at its greatest output. In order to overcome this and permit of any easily made and stable setting of the follower plate 21 with its attached spider 20 and gear 12 at any desired point for the particular volume or delivery wanted, I provide a balanced valve whereby the pressures are balanced and the follower-spider-gear assembly will automatically seek its position according to the setting of the valve.

Within the follower 21 (Figs. 8 and 9) is a valve chamber 25 in which fits a piston valve 26 having pistons 27 and 28. Toward the extremities of this valve chamber are two exhaust ports 29 and 30 connected by the cut 31 in the side of the follower 21. A second exhaust passage 33 leads from the valve chamber across the follower 21 to an outlet 34 on the inlet or suction side of the pump. Therefore the portions of the valve chamber outside of the pistons 27 and 28 will always be open to the suction of the pump. From the outlet or pressure side of the pump another cut 35 in the side of the follower 21 leads to the port 36 in the central portion of the valve chamber. Therefore the space between the pistons 27 and 28 of the valve will always be at the output pressure developed by the pump. Also leading from the valve chamber is a port 37 and passage 38 leading upward to the annular groove 39 in the rear of spider 20 which in turn connects with the passage 38° to the interior of this spider. Also a port 39 goes to the passage 40 and thence to the point 41 where it opens into the circular cut 42 in the face of the follower 21. This circular cut 42 registers with a concentric series of holes 43 passing through the gear 12 and opening into the inner portion of the spider 10 (Figs. 4, 8 and 9). Likewise, there is a passage 44 connecting the valve chamber with the lower recessed portion of the follower plate.

The valve 26 may be connected to any suitable actuating mechanism such as is shown in Fig. 1 where the valve is connected to the operating arm 45 pivoted by the link 46 and having a guide 47 upon which the arm 45 may be locked in any position by the wing nut and bolt 48.

The operation of the pump is as follows. The shaft 15 will drive the gear 19 and carry the spider 20 with it; these two always being in some degree of engagement. Gear 19 drives gear 12 which in turn carries spider 10 with it; these two also being always in some degree of engagement (Fig. 2). Then with the parts in the positions of Fig. 4, the pump will deliver maximum volume and the valve will be in the position of Fig. 8 with passages 38, 40 and 44 closed by the pistons 27 and 28. The internal pressure act-
the assembly just described is a die member 65 cooperating with the punch 63 in the usual manner. This die member is carried by a transverse bar 66 secured at its ends to the bars 37. The bar 66 is longitudinally slotted, as shown at 69, to permit adjustment of the die member, the screws 67 which secure said member passing through said slots.

It will be evident from the foregoing that the punch 63 and the die member 65 are operated by the bars 38 and 37 in the same manner as the punch and die members 39 and 40 hereinbefore described.

After the holes G are made in the web, the latter passes between guide blocks 68 adjustably mounted on cross rods 68a in the same manner as the guide blocks 48.

The web now reaches a cutting mechanism which makes the transverse cuts F to divide the web into the individual tags. This mechanism is also operated by the bars 38 and 37 and it consists of the following parts:

On the inner faces of the bars 38 are secured guides 69 between which is yieldably mounted a cross head 70 backed at the top by a spring 71 held by a cap piece 72 carried by the guides 69. The cross head carries the supporting bar 73 of the cutting blade 74. Cooperating with the blade 74 is a knife blade 75 secured to a cross bar 76 fastened to and spanning the bars 37. Screws 77 are provided for adjusting the blade 75 relative to the blade 74.

In the art it is often desirable to apply the operation of "ganging slitting" to the web, or in other words to partly sever the tags from each other so that they may remain in a continuous strip. For this purpose, the cross-head 70 is provided with a depending pin 78, which on the downward or cutting stroke is adapted to enter either a recess 79 or hit the peripheral portion of a gage disk 80 according to the position of the latter. If the pin goes down into a recess, the blade 74 makes a full stroke to completely sever the tags, whereas if the pin hits the periphery of the disk, the blade goes down just far enough to score the web. During the last described action, the bars 38 continue making a full downward stroke, but the cross-head 70 remains stationary due to its yielding connection with the bars 38.

The shaft 81 carrying the disk 80 is carried by the bars 37, and is provided with a ratchet 82 engageable by a pawl 83 carried by a lever 84 fulcrumed on the shaft 81 and connected by a link 85 to one of the standards 13.

During the operation of the machine, the motion of the bars 37 impart a step-by-step rotary motion to the shaft 81 through the pawl-and-ratchet mechanism. The ratchet 82 is shown provided with twelve teeth, and the disk 80 is shown provided with six recesses 79. It will therefore be evident that the cutting mechanism will first make a pre-

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1. In a mechanism for severing stock, a reciprocatory member, a knife, a support for the knife yieldably carried by the reciprocatory member, a stem extending from the knife support, and a gage member positioned to intercept the stem for gaging the length of the cutting stroke of the knife.

2. In a mechanism for severing stock, a reciprocatory member, a knife, a support for the knife yieldably carried by the reciprocatory member, a stem extending from the knife support, and a rotatable gage member positioned to intercept the stem for gaging the length of the cutting stroke of the knife.

3. In a mechanism for severing stock, a reciprocatory member, a knife, a support for the knife yieldably carried by the reciprocatory member, a stem extending from the knife support, and a gage member in the path of the stem for stopping the knife before its cutting stroke is completed to score the stock.

4. In a mechanism for severing stock, a reciprocatory member, a knife, a support for the knife yieldably carried by the reciprocatory member, a stem extending from the knife support, a gage member in the path of the stem, and means for operating said gage member at intervals to stop the knife before its cutting stroke is completed to score the stock.

5. In a mechanism for severing stock, a reciprocatory member, a knife, a support for the knife yieldably carried by the reciprocatory member, a stem extending from the knife support, a rotatable gage member having depressions and high places which are in the path of the aforesaid stem, said stem when entering the depressions permitting the knife to make a full cutting stroke, and when engaging the high places stopping the knife before its cutting stroke is completed to score the stock, and means for controlling the operation of the gage member.

6. In a mechanism for severing stock, a reciprocatory member, a knife, a support for the knife yieldably carried by the reciprocatory member, a stem extending from the knife support, a rotatable gage member having depressions and high places which are in the path of the aforesaid stem, said stem when entering the depressions permitting the knife to make a full cutting stroke, and when engaging the high places stopping the knife before its cutting stroke is completed to score the stock, a ratchet wheel operatively conn-
connected to the gage member, a reciprocatory carrier for the gage member and the ratchet wheel, a lever movable with the carrier and having a pawl which engages the ratchet wheel, a stationary support, and a link connecting the lever to said support.

7. A scoring and cutting mechanism for stock comprising a knife adapted for engaging the stock, a support and actuator having a yieldable driving connection with said knife, and means to limit the cutting stroke of the knife whereby the knife is moved only partly through the stock to score the same.

8. A scoring and cutting mechanism for stock comprising a knife adapted for engaging the stock, a support and actuator having a yieldable driving connection with said knife, and means to limit the cutting stroke of the knife whereby the knife is moved only partly through the stock to score the same, there being means whereby said support and actuator is moved in a fixed path.

9. A machine of the class described comprising a support, a second support, co-acting work engaging members carried by the first and second-named supports and adapted to engage constantly traveling work, which work is moved in a plane between said first and second-named supports, means to move the supports in continuous circular paths to cause the work engaging members to approach each other at approximately the same time and recede from each other at approximately the same time, the movement of the work engaging members while approaching each other being generally in the direction of travel of the work, said co-acting work engaging members being positioned approximately at right angles to the line of travel of the work which passes in a plane between the first and second-named supports.

10. A machine for treating a continuously moving web, comprising longitudinal members on both sides of the web and parallel thereto, said members approaching and receding from the web with a circular movement harmonious with the movement of the web, and cooperative web-treating appliances carried by the respective members along the course contiguous with the web.

11. A web-treating mechanism comprising laterally-spaced supports, upper and lower shafts journaled in the same and formed with eccentrics, longitudinal upper and lower members spanning the supports to journal the corresponding eccentrics, cooperative appliances carried by the respective members for the treatment of a web movable between the latter, and a gearing to operate said eccentrics in the same direction, whereby to carry said members in substantially circular paths toward and from the web and in harmony with the movement thereof.

12. A machine for treating a moving web comprising a structure of substantially quadrilateral form, upper and lower transverse shafts journaled in the same near the ends and formed with eccentrics, upper and lower members along the sides of the structure to journal the corresponding eccentrics, cooperative appliances carried crosswise of the structure by the upper and lower sets of members respectively, and a gearing to operate said eccentrics in the same direction, whereby to carry said members in substantially circular paths toward and from the web and in harmony with the movement thereof.

13. In a web treating machine, a supporting frame, upper and lower sets of longitudinal members carried by said frame, means for imparting to said members an oscillatory motion in the direction of their length and also in directions whereby the upper and lower sets are made to alternately approach and recede from each other in the general direction of a constantly moving web, a punch carried by one of the sets, and a die carried by the other set.

14. In a web treating machine, a supporting frame, upper and lower sets of longitudinal members carried by said frame, means for moving said members in continuous and approximately circular paths whereby the upper and lower sets are made to alternately approach and recede from each other in the general direction of a constantly moving web, a punch carried by one of the sets, and a die carried by the other set.

15. In a web treating machine, a supporting frame, upper and lower sets of longitudinal members carried by said frame, means for imparting to said members an oscillatory motion in the direction of their length and also in directions whereby the upper and lower sets are made to alternately approach and recede from each other, a vertically positioned plate supported for a sliding movement with the members when the latter move in a longitudinal direction, said members slidably engaging the ends of said plate, punch and die elements, brackets slidably supporting said elements and carried by the plate, an operative connection between one set of members and the punch element, and an operative connection between the other set and the die element.

16. In a web treating machine, a supporting frame, upper and lower sets of longitudinal members carried by said frame, means for imparting to said members an oscillatory motion in the direction of their length and also in directions whereby they are made to alternately approach and recede from each other, a vertically positioned plate supported for a sliding movement with the members when the latter move in a longitudinal direction, said members slidably engaging the ends of said plate, punch and die elements, brackets slidably supporting said elements and carried by the plate, a cross bar applied to...
one of the aforesaid sets of members, to which cross bar the punch element is fastened, and a cross bar applied to the other set, to which last-mentioned cross bar the die element is fastened.

17. In a web treating machine, a supporting frame, upper and lower sets of longitudinal members carried by said frame, transverse shafts having eccentric end portions journaled in the respective sets of members, a vertically positioned plate supported for a sliding movement with the members when the latter move in a longitudinal direction, said members slidably engaging the ends of said plate, punch and die elements, brackets slidably supporting said elements and carried by the plate, an operative connection between one of the aforesaid sets of members and the punch element, and an operative connection between the other set and the die element.

18. In a web treating machine, a supporting frame, upper and lower sets of longitudinal members carried by said frame, transverse shafts having eccentric end portions journaled in the respective sets of members, a vertically positioned plate supported for a sliding movement with the members when the latter move in a longitudinal direction, said members slidably engaging the ends of said plate, punch and die elements, brackets slidably supporting said elements and carried by the plate, a cross bar connecting one of the aforesaid sets of members, to which cross bar the punch element is fastened, and a cross bar connecting the other set, to which last-mentioned cross bar the die element is fastened.

In testimony whereof I affix my signature.

IRVIN L. YOUNG.