

May 12, 1936.

W. JOYCE

2,040,745

MACHINE FOR MANUFACTURING PAPER EXCPLSIOR

Filed Aug. 5, 1931

2 Sheets-Sheet 1

Fig. 1.

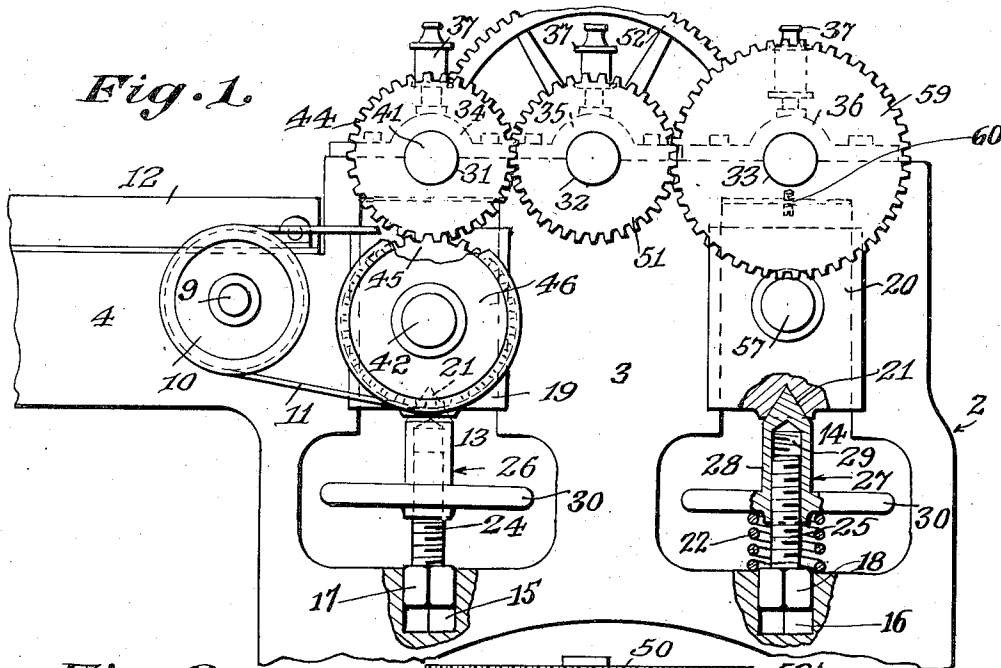


Fig. 2.

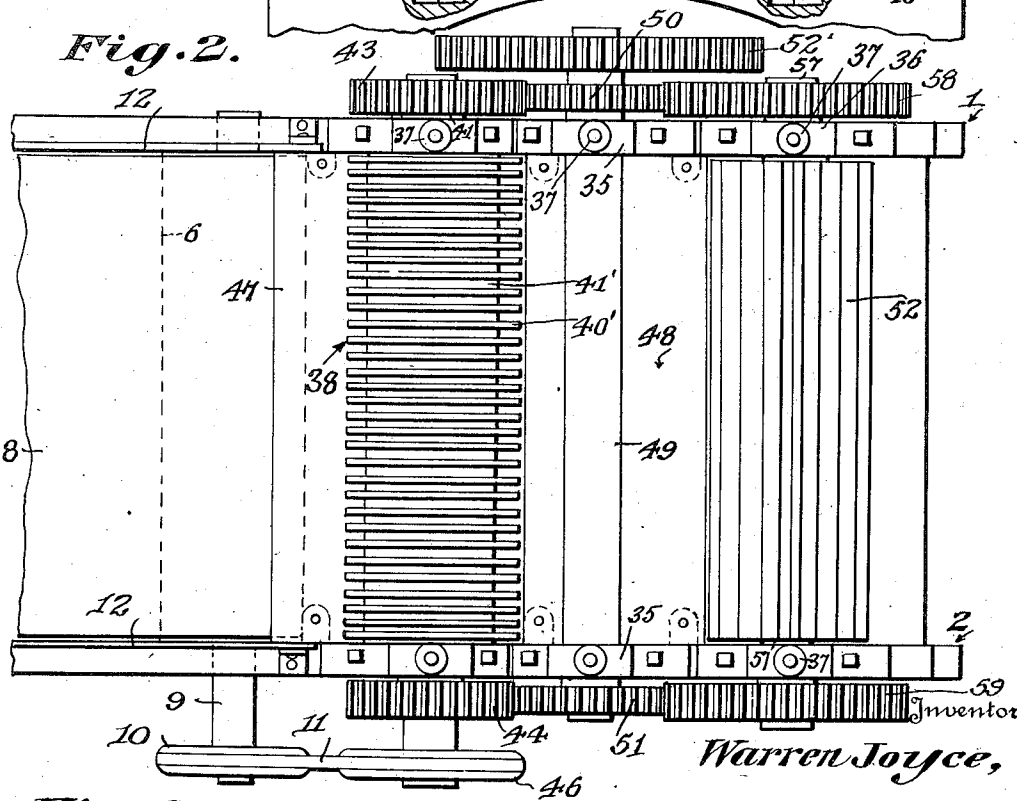
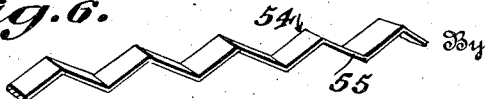


Fig. 6.



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Fig. 3.

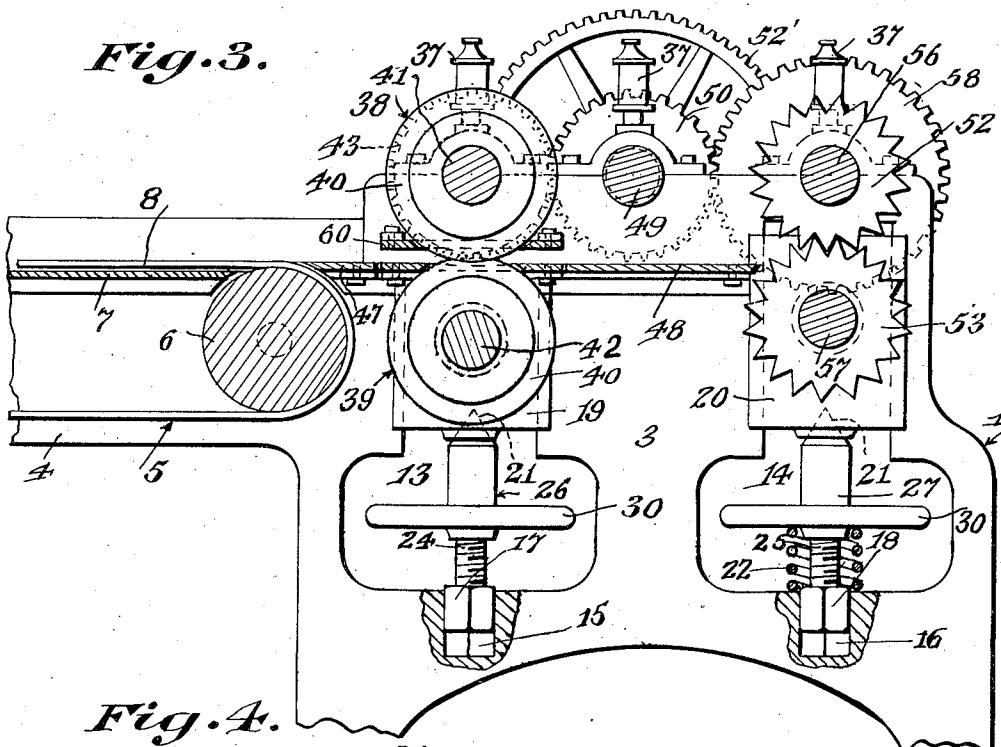


Fig. 4.

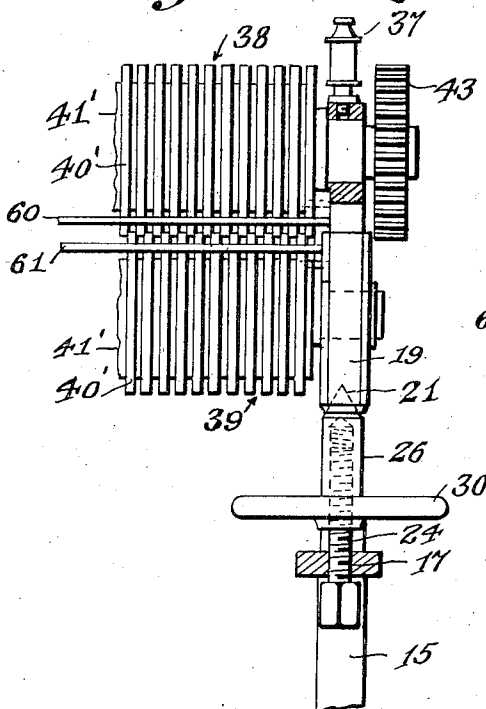
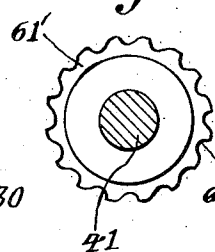
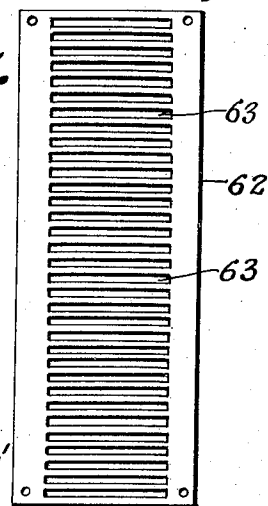


Fig. 5.

Fig. 1.



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UNITED STATES PATENT OFFICE

2,040,745

MACHINE FOR MANUFACTURING PAPER
EXCELSIOR

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Application August 5, 1931, Serial No. 555,318

6 Claims. (Cl. 154—30)

My invention relates to a machine for manufacturing paper excelsior for packing purposes.

The essential objects of my invention are to cut from paper stock strips having maximum width, strength and resiliency; prevent the paper from following around the cutters after the cutting has been performed; avoid heating up of the cutters by preventing friction therebetween; provide for adjustment to take care of changing amount of stock which may be fed through the machine from time to time; and to attain these ends in a strong, durable, compact, thoroughly efficient and comparatively inexpensive structure.

To the above ends essentially my invention consists in such parts and such combination of parts as fall within the scope of the invention as claimed.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is a fragmentary view in side elevation of a machine in accordance with this invention.

Figure 2 is a fragmentary view in top plan.

Figure 3 is a like view in longitudinal section.

Figure 4 is a fragmentary view in front elevation illustrating the cutter rolls.

Figure 5 is a top plan of the stripper element.

Figure 6 is a perspective view of the product produced.

Figure 7 is a sectional detail illustrating a modified form of cutting blade.

The machine includes a body part in the form of a frame having a pair of upstanding side members 1, 2 of the desired length and height. Each side member has its rear portion 3 of greater height than the remaining portion 4. Arranged between the portions 4 is an endless conveyor 5 driven from a roll 6 arranged at one end thereof. The roll for the other end of the conveyor 5 is not shown, but it is of known arrangement. Connected to the side portions 4 is a plate, table or platform 7 over which the upper stretch 8 of the conveyor 5 travels and which constitutes a support for the stretch 8. The roll 6 is carried by a shaft 9 which is journaled in the side portions 4, extends laterally from one of such portions and carries on its extended end a pulley 10 driven from a transmission belt 11. The roll 6 is arranged in proximity to the portions 3 of the side frames 1, 2. Secured upon the top edges of the portions 4 and extending lengthwise of the latter are bars 12 standing on their lower lengthwise edges thereof and which provide re-

tainers for the stock as it is to be fed to the cutters.

Each rear portion 3 is formed with a pair of aligning, vertically disposed openings 13, 14 and polygonal shaped sockets 15, 16 respectively.

Slidably mounted in each opening 13 is an adjustable bearing 19 and slidably mounted in each opening 14 is a spring controlled adjustable bearing 20. The bearings 19 oppose each other. The bearings 20 oppose each other. Each of said bearings has its bottom formed with a conoidal shaped socket 21. The controlling springs for the bearings 20 are indicated at 22.

Slidably mounted in the sockets 15, 16 respectively are the heads 17, 18 respectively of threaded supports 24, 25 respectively for bearing adjusters 26, 27 respectively. Each adjuster comprises a pointed stem 28 formed with a socket 29 having a threaded wall and a hand wheel 30 at the lower end of stem 28. Each stem threadedly engages with a threaded support and is vertically adjustable relative thereto. The pointed end of each stem seats in a socket 21. The adjusters 26 are for the bearings 19 and the adjusters 27 for the bearings 20. The bearings 19 are independently adjustable with respect to the bearings 20 and vice versa. The springs 22 surround the supports 27 and are interposed between the wheels 30 of the adjusters 27 and the bottom walls of the openings 14.

Each rear portion 3 has its top edge formed with spaced semi-circular bearing parts 31, 32 and 33. The bearing parts on the top edge of one portion 3 align with the bearing parts on the other rear portion. Secured to the top edge of each rear portion 3 is a set of spaced semi-circular flanged bearing caps 34, 35 and 36 which coact with the bearing parts 31, 32 and 33 respectively. The bearing caps are provided with lubricant supply cups 37.

The machine includes upper and lower intermeshing cutter elements generally indicated at 38, 39 and which coact to cut the paper stock into strips. Each cutter element is in the form of a roll and consists of a series of circular non-beveled edged blades 40' spaced by circular disks 41' of less diameter than that of the blades. The perimeter of each face of the blade is not beveled whereby the blades are rectangular. The blades and spacer discs of the upper element are alternately disposed with respect to the blades and discs of the lower element. The blades and discs of each element are mounted at their axes upon a shaft. The shaft for the upper element

is indicated at 41 and that for the lower element at 42.

The shaft 41 is journaled in the bearing parts 31 and caps 34. The shaft 42 is journaled in the bearings 19. The shaft 41 at each end adjacent the side portions 3 carries a gear and which are indicated at 43, 44. The shaft 42 at one end and adjacent a bearing 19 carries a gear 45 and a pulley 46. The gear 44 meshes with and drives gear 45. The belt 11 is driven from pulley 46. The shafts 41 and 42 are arranged in parallelism.

The paper stock from the upper stretch 8 of the conveyor 5 is passed upon a conducting plate 47 which is arranged at the front of the cutter element 39 and supported from the portions 4. Supported by the rear portions 3 and arranged in alignment with the plate 47 is a conductor plate 48 for the strips which have been cut from the paper stock. The plate 48 is arranged rearwardly of element 39.

Journalled in the bearing parts 32 and bearing caps 35 is the operating shaft 49 of the machine and which carries on each end a gear and said gears are indicated at 50, 51. The shaft 49 also carries a driving gear 52' therefor. The gear 52' is of greater diameter than gears 50, 51 and is connected to a prime mover not shown. The gears 50, 51 are of less diameter than and mesh with the gears 43, 44 respectively for driving them.

The machine also includes a pair of upper and lower intermeshing strip crimping rolls or drums arranged in superposed relation and indicated at 52, 53 respectively. Each crimping roll has a corrugated periphery. Each corrugation is of V-form whereby the periphery of the crimping roll is formed with V-shaped teeth. The crimping rolls act upon the strips to form the latter with oppositely disposed triangular portions to provide for maximum resiliency thereof. The strip produced is referred to generally at 54 and the triangular portions at 55 Figure 6. The shafts for the crimping rolls 52, 53 are indicated at 56, 57 respectively.

The shaft 56 is journaled in the bearing parts 33 and bearing caps 36 and carries at one end a gear 58 meshing with the gear 50 and at its other end is provided with a gear 59 which meshes with the gear 51. The gears 58 and 59 are of greater diameter than the gears 43, 44, 45, 50 and 51. The shaft 57 is journaled in the bearings 20.

The machine also includes a pair of stripper elements each associated with a cutter element. The stripper elements are arranged in superposed spaced relation and anchored at their ends to the rear portions 3 of the side members 1, 2. The stripper elements are indicated at 60, 61, the former associated with the element 38 and the latter with element 39. Each stripper element consists of an oblong plate 62 provided with transversely extending parallel spaced slots 63 for the passage of the blades of that cutter element with which it is associated. The stripper elements prevent the paper from following around the cutter elements after the cutting has been performed. The stripper element 61 is arranged in alignment with the plates 47 and 48. The plate 48 is arranged forwardly of crimping roll 53.

The machining on the blades and strippers is so exact to provide the necessary clearance therebetween without interfering with the desired cutting action, thereby preventing friction, thus avoiding the heating up of the cutter elements.

The blades and spacer discs can be of any

suitable thickness, preferably the blades will be .187 thick and the discs .188. The upper cutter element meshes into the lower cutter element, thus providing a true cutting on both sides of the blades. The meshing of the cutter elements is had between the superposed stripper elements.

The tension of the springs 22 is controlled by the adjusters 27. The springs 22 function to keep the crimping rolls in just the proper meshing at all times, so the rolls will function to crimp either a single sheet of paper or quantities up to one-quarter inch in thickness. The top wall of each opening 14 is provided with a maximum mesh adjusting screw 60.

Figure 7 of the drawings illustrates a modified form of cutter blade 61' of circular disc like form and which has its edge provided with hooked notches 62' which positively draws the paper between the cutter rolls as soon as it comes into contact with the paper. This prevents the paper from being cut to a certain point and sticking when the conveyor belt fails to perform the necessary feed of the stock.

What I claim is:—

1. In a machine for producing crimped excelsior, a pair of superposed, rotatable, intermeshing cutting elements for cutting stock into strips and each including spaced circular blades having throughout and transversely of the edge thereof hooked shaped notches.

2. In a machine for producing crimped excelsior, a pair of superposed, rotatable, intermeshing cutting elements for cutting stock into strips and each including spaced circular blades having throughout and transversely of the edge thereof hooked shaped notches, and a pair of spaced, superposed stripper elements, each associated with and through which travels the blades of a cutter element.

3. In a machine for producing excelsior in crimped strip-like form, a frame including a pair of upstanding side members, a conveyor for the material to be acted upon arranged between opposed portions of said side members, a pair of superposed spaced stripper elements bridging the spaces between and fixedly secured to said side members rearwardly of said conveyor, a pair of spaced independently vertically adjustable lower shafts supported in said side members, a pair of spaced upper shafts aligning with said lower shafts and supported upon said side members, intermeshing superposed strip cutting elements carried by one upper and one lower shaft and traveling through said stripper elements, intermeshing superposed strip crimping elements carried by the other upper and the other lower shaft, means to provide for the synchronous operation of said conveyor, cutting elements and crimping elements, a conducting plate interposed between the top of the lower cutting element and top of the lower crimping element, and a conducting plate interposed between one end of the top of the conveyor and the lower stripper element.

4. In a machine for producing excelsior in crimped strip-like form, a pair of superposed intermeshing rotatable strip cutting elements, a pair of superposed intermeshing strip crimpers, each arranged in parallel spaced relation to one of the cutter elements, a support common to the upper cutting element and upper crimper, two spaced parallel pairs of parallel spaced vertically adjustable bearing structures slidably mounted in said support, one pair supporting the lower cutting element and the other pair the lower

crimper, and a pair of spaced superposed strip-
pers arranged within and anchored at their ends
to said support, one associated with and through
which travels the upper cutting element and the
other associated with and through which travels
5 the lower cutting element.

5. In a machine for producing excelsior in
crimped strip-like form, a pair of superposed
intermeshing rotatable strip cutting elements, a
10 pair of superposed intermeshing strip crimpers,
each arranged in parallel spaced relation to one
of the cutter elements, a support common to the
upper cutting element and upper crimper, two
spaced parallel pairs of parallel spaced vertically
15 adjustable bearing structures slidably mounted
in said support, one pair supporting the lower
cutting element and the other pair the lower
crimper, a pair of spaced superposed strippers
arranged within and anchored at their ends to
20 said support, one associated with and through
which travels the upper cutting element and the
other associated with and through which travels
the lower cutting element, material conducting
means aligning with the lower stripper, and cut

material conducting means extending from the
lower stripper to the lower crimper.

6. In a machine for producing excelsior in
crimped strip-like form, a pair of superposed in-
termeshing rotatable strip cutting elements, a
5 pair of superposed intermeshing strip crimpers,
each arranged in parallel spaced relation to one
of the cutter elements, a support common to the
upper cutting element and upper crimper, two
spaced parallel pairs of parallel spaced vertically
10 adjustable bearing structures slidably mounted
in said support, one pair supporting the lower
cutting element and the other pair the lower
crimper, a pair of spaced superposed strippers
arranged within and anchored at their ends to
15 said support, one associated with and through
which travels the upper cutting element and the
other associated with and through which travels
the lower cutting element, said lower crimper be-
ing driven from the upper crimper, and means for
20 synchronously operating said cutting elements
and upper crimper.

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