

March 18, 1930.

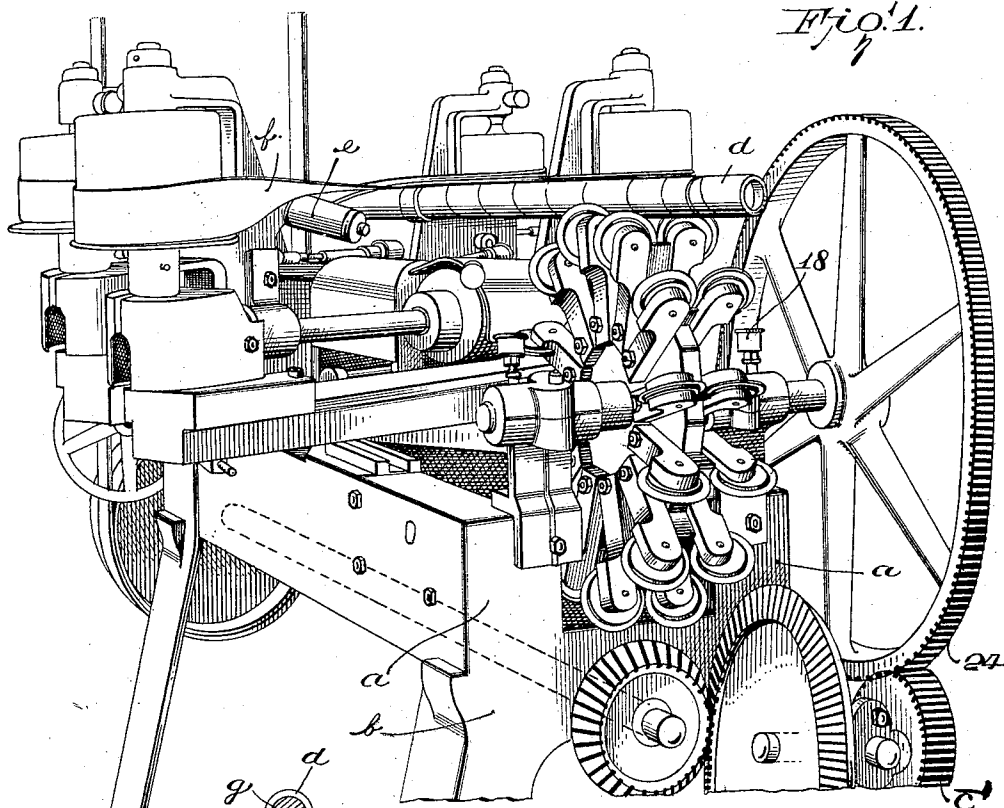
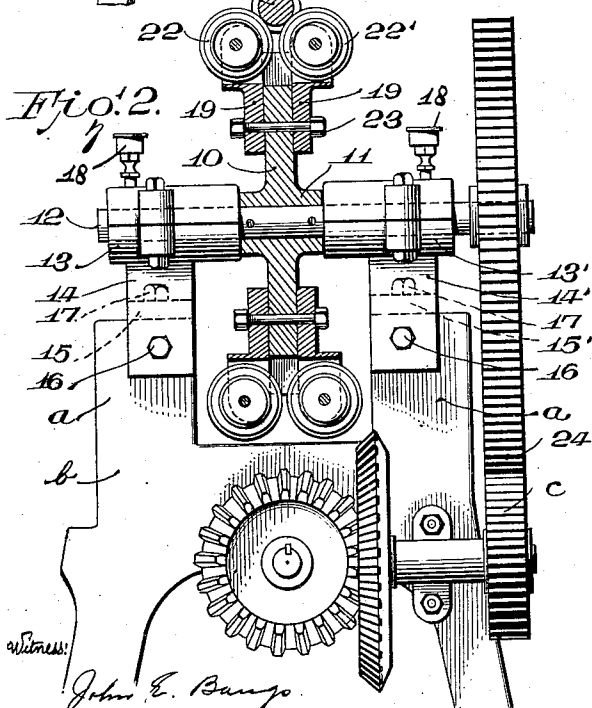
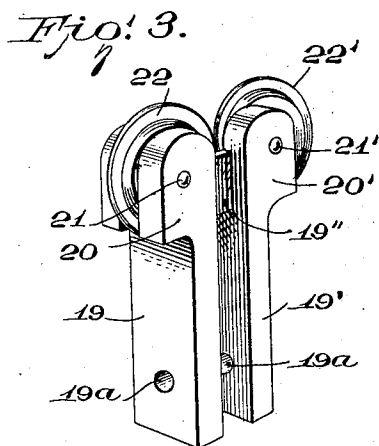
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1,751,293

CUTTING DEVICE

Filed June 30, 1927

2 Sheets-Sheet 1



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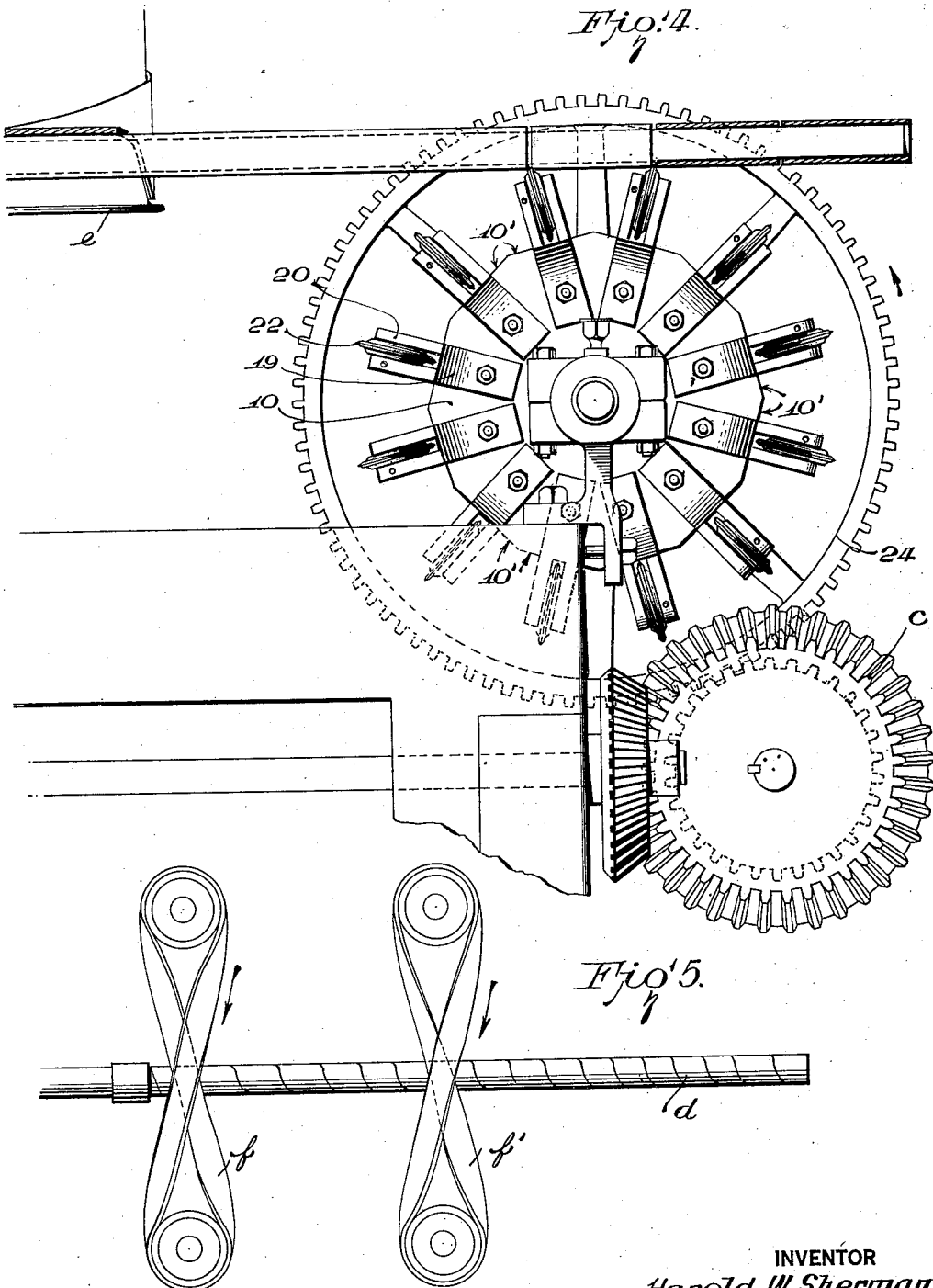
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CUTTING DEVICE

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This invention relates to improvements in cutting devices generally, and more particularly to a type of such device to be employed in connection with paper tube forming machines and the like.

The principal object of the invention is to provide for a cutting device adapted to be employed as an attachment to paper tube forming or other kindred types of machines, and to be operative therewith to automatically cut the product of such a machine into predetermined uniform lengths as the product is delivered from the forming mechanism thereof.

Another object of the invention is to provide for a cutting mechanism as hereinbefore characterized, and one of a mechanically refined construction and arrangement of parts, which, in its particular adaptation, is to be easily and readily mounted in position adjacent to or directly on the base or bed of a paper tube forming machine, whereby to cut the tubing, in its passage from the machine, into suitable uniform lengths to form cores for toilet paper rolls.

A further object of the invention is to provide for a cutter of the class set forth, and one of an extremely simplified construction and arrangement whereby the cutting elements and their supports are interchangeable and otherwise adapted to be displaced from and remounted into operative positions for quick repair and replacement of parts and in a manner not requiring the dismantling of the cutter, in its entirety, from its position of operation.

With the foregoing and other objects in view, the invention resides in the certain new and useful combination, construction and arrangement, of parts as will be hereinafter more fully described, set forth in the appended claims, and illustrated in the accompanying drawing, in which:

Figure 1 is a fragmentary perspective view of a conventional form of paper tube forming machine, showing a practical application of the cutting device thereto,

Figure 2 is a vertical transverse section through the device per se, with the paper tube forming machine in end elevation,

Figure 3 is a slightly enlarged perspective view of one of the cutter units of the device,

Figure 4 is a side elevation of the device as operatively positioned on the base or bed of the said machine, and

Figure 5 is a fragmentary plan view of a section of the paper tubing and the presser belt mechanism cooperative therewith to effect the adhesion of the cemented spiral paper strips forming the tube section.

Referring to the drawing, wherein similar characters of reference designate corresponding parts throughout the several views thereof, the preferred embodiment of the cutting device, as shown, comprises a substantially circular body or disc 10, having a centrally disposed and oppositely offset hub portion 11, which is keyed on a shaft 12. The shaft 12 is journaled at the opposite ends of the hub 11 in split bearings 13 and 13' carried at the upper ends of the supporting brackets or standards 14 and 14'. These supporting brackets or standards 14 and 14' are formed to provide angularly offset shoulder portions 15 and 15' respectively, at their inner sides and spaced upwardly from their lower ends, whereby, with the shouldered portions 15 and 15' engaged over and resting on the adjacent end portions *a* and *a'* of the base or bed *b* of the paper tube forming machine, the lower end portions thereof, depending below the horizontal planes of the lower faces of the offset shoulder portions 15 and 15', will abut the opposed end faces of the base or bed portions *a* and *a'* in a manner to cooperate with the shoulders in effectively supporting the cutter body 10 in its operative position, and practically free from vibration during its rotation with the shaft 11. The lower end portions of the supporting brackets or standards 14 and 14' are to be detachably secured in abutted relation against the end faces of the base or bed portions *a* and *a'* respectively, of the paper tube machine, by means of the bolts or screws 16, while the shouldered portions 15 and 15' are similarly secured to the top faces of the base or bed portions *a* and *a'* by means of the bolts or screws 17. The bearings 14 and 14' each have their up-

per removable portions formed to have attached thereto a suitable lubricating device 18.

Equidistantly spaced around the peripheral edge of the cutter body or disc 10 are a plurality of cutter units each of which consists of a bracket formed to provide spaced parallel leg portions 19 and 19' joined together at one end by a connecting portion 19'' of a slightly reduced width with respect thereto. Offset laterally and vertically from the connected ends of the leg portions 19 and 19' are pairs of spaced ears or lugs 20 and 20' respectively. These pairs of ears or lugs 20 and 20' are each formed to provide aligned apertures to journal therein the opposite ends of shafts or spindles 21 and 21' on the medial portions of which, between the complementary ears or lugs, are keyed the circular cutters 22 and 22'. The brackets, as thus constructed are substantially U-shape in side elevation, and may be of one piece metal castings suitably machined to desired proportions and finish.

In assembling the cutter units, as thus constructed and arranged, on the cutter body or disc 10, the same are to be engaged over the peripheral edge thereof, with the leg portions 19 and 19' extending radially upward at the opposite sides of the same, and with the connecting portions 19'' seated on the peripheral edge, substantially as shown. The legs 19 and 19', of each of the cutter brackets, are provided with aligned apertures 19^a (Figure 3), which are to be aligned with a complementary aperture formed in the cutter body or disc 10, for the engagement therewith of the securing bolts 23. The peripheral edge of the cutter body or disc 10 is preferably formed to provide for a series of chordal surfaces 10', one merging into the other, and the number of which will determine the number of cutter units to be employed with a cutter body or disc of varying diameters.

With the cutter assembly mounted on the shaft 12, and the supporting brackets or standards 14 and 14' secured in position on the base or bed portions *a* and *a'* of the paper tube making machine, as hereinbefore explained, one end of the shaft 12 will be extended outwardly of one of the bearings 13 or 13', and have a driving element 24 keyed thereon and operatively connected to a driven part of the actuating mechanism of the paper tube machine. In the present instance, the extended end of the shaft 12 is projected outwardly from the bearing 13' and the driving element 24 keyed thereon is in the form of a toothed gear which is disposed in meshing engagement with a driven gear *c* of the power transmitting mechanism of the paper tube machine.

In the operation of the cutting device, when thus mounted in position on the paper tube machine, the cutter body or disc 10 will be

supported in the vertical plane defined by the line of horizontal travel of the paper tubing *d* as it is delivered from the forming mechanism *e*, and at a height, above the base or bed portions *a* and *a'*, so that the pairs of cutters 22 and 22', as they successively approach the high point in the peripheral travel of the cutter body or disc 10, when the latter is being rotated, will engage the lower side of the paper tubing and from the point of movement or contact therewith will initiate the severing operation thereon, which operation will continue and be completed before the cutters are carried in a downward direction at the opposite side of the high point of peripheral travel of the same during the continued rotation of the cutter body or disc 10. In its passage into engagement with and between the pairs of cutters 22 and 22', from the forming mechanism *e* of the tube making machine, the tubing is subjected to a downwardly directed pressure exerted thereon by the devices *f* and *f'*, so that the outer end portion of the same, as it passes between the pairs of cutters 22 and 22', is forced firmly against the cutting edges of the latter and sufficiently so as to cause the cutters to be rotated therewith for the desired severing operation. With the cutting units arranged in proper equidistantly spaced relation around the periphery of the body or disc 10, the tubing *d* will be severed in predetermined lengths defined by the distance between the cutting edges of the pairs of adjacent cutters of the several cutter units. To effect the proper and efficient cutting of the tubing, the ratio of the gear *c*, of the tube forming machine, and the gear 24, of the cutting mechanism, must be such that the peripheral speed of the cutting points on the pairs of cutters 22 and 22', on the cutter body or disc 10, is equal to that of the tubing, it being understood that the tubing *d* is constantly rotated by revolving shaft *g* (Figure 2), along which it travels in its passage from the forming mechanism.

Without further description, it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention or its scope as claimed.

Having thus fully described the invention what is claimed is:

1. A rotary cutter comprising a disc-like body having its peripheral edge of polygonal form, members extending radially from said body and in line with the transverse centers of each of the polygonal faces of the edge portion thereof, and pairs of rotary cutters journaled in the opposite sides of the outer ends of said members.

2. A rotary cutter comprising a substan-

5 tially circular body, substantially U-shaped brackets straddled over the peripheral edge of said body and having portions projecting beyond the latter, and pairs of transversely arranged cutters journaled in the outer ends of said brackets.

10 3. A rotary cutter comprising a disc-like body having its peripheral edge of polygonal form, substantially U-shaped brackets straddled over the peripheral edge of said body and seated on the polygonal faces thereof, said brackets having enlarged portions extending beyond the peripheral edge of said body and each transversely bifurcated, and a
15 rotary cutter journaled in the bifurcation of each of the enlarged portions of said brackets.

20 4. A rotary cutter comprising a disk-like body having its peripheral edge of polygonal form, substantially U-shaped brackets straddled over the peripheral edge of said body and seated on the transverse centers of the polygonal faces thereof, said brackets having oppositely disposed enlarged portions at the outer ends thereof and extending beyond the
25 peripheral edge of said body, each of said enlarged portions being transversely bifurcated, and a rotary cutter journaled in each of the bifurcations of the enlarged portions of said brackets.

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