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MECHANISM FOR FORMING INDENTATIONS IN A MOVING ROD OF PLASTIC MATERIAL

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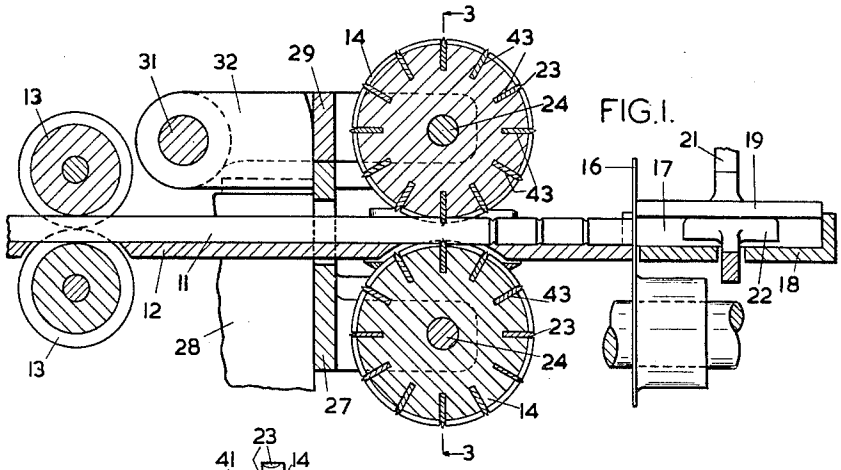


FIG. 1.

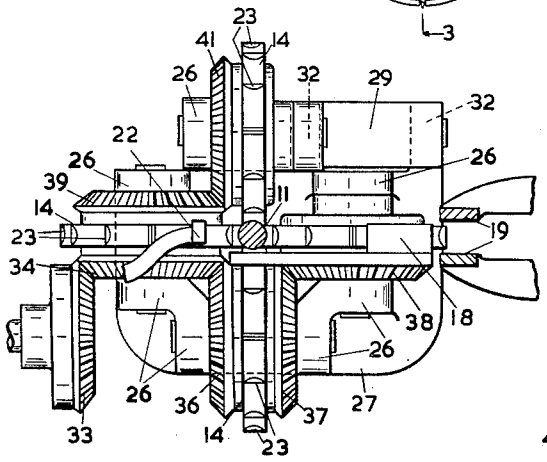


FIG. 2.

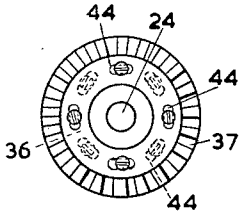


FIG. 4.

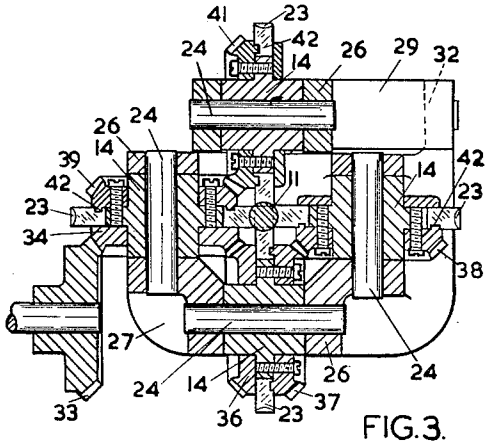


FIG. 3.

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MECHANISM FOR FORMING INDENTATIONS IN A MOVING ROD OF PLASTIC MATERIAL

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2 Claims. (Cl. 107—7)

This invention releates to mechanism for forming indentations in a moving rod of plastic material, e. g., toffee or like confectionery, of substantially circular, elliptical or similar cross-section, and is particularly concerned with the forming of such indentations in a rod of toffee as it is fed towards to toffee cutting and wrapping machine, for the purpose of dividing the finished toffee into sections which can be broken off at will.

According to the invention, there is provided a mechanism of the above type, comprising three or more marking rollers arranged with their axes in a common plane and having their peripheral surfaces shaped to correspond with the cross-sectional shape of the rod, and arranged to approach each other so as to form an aperture for the passage of the rod, at least one marking knife protruding from the peripheral surface of each roller and arranged so as to move into register with the knives in the other rollers, and means for driving the rollers synchronously at the same peripheral speed. Preferably, four rollers are used each having a plurality of knives, and the knives are arranged with their cutting edges lying parallel to the axes of the rollers and terminating at the maximum diameter of the rollers.

The marking rollers may also serve as feed rollers for the rod, though generally it is preferred to provide separate or additional rollers for feeding and shaping the rod as it is delivered continuously from a rod-forming apparatus, the marking rollers then serving to urge the rod forward during the marking operation.

The invention will now be described in greater detail with reference to the accompanying diagrammatic drawings, as applied to a toffee-cutting and wrapping machine for producing wrapped toffees of circular cross-section.

In the drawings:

Figure 1 is a sectional elevation of part of such a machine,

Figure 2 is an end view of the apparatus illustrated in Figure 1, as seen in the direction of the arrow in Figure 1,

Figure 3 is a section taken on the line 3—3 of Figure 1, and

Figure 4 is an elevation of a detail of the apparatus.

Referring to Figure 1, a rod **11** of plastic toffee of circular cross-section is fed along a guide channel, indicated at **12**, by a pair of feed rollers **13** towards a set of four marking rollers **14** which, in turn, urge the rod **11** towards a rotating knife **16** which severs the rod at intervals so as to leave severed lengths **17** in succession on a feed channel **18** leading to the wrapping elements of the wrapping machine. As soon as the lengths **17** are severed, they are fed in succession in known manner into successive pockets **19** of an intermittently rotatable pocket wheel **21** of the machine by a reciprocating pusher **22**. The invention is not specifically concerned with the action of the pusher **22** or the wrapping operations of the machine, and it is not necessary, therefore, to describe such parts of the machine herein.

The marking rollers **14**, the feed rollers **13** and the pocket wheel **21** are synchronously driven intermittently so as to provide a rest period during which the rotating knife **16** passes through the rod **11**. The rollers **14** have their peripheries shaped to correspond with the shape of the rod, and each is provided with a plurality of marking knives **23** protruding from the peripheral surface of the roller and terminating at the maximum diameter of the roller.

The marking rollers **14** are arranged with their axes in a common plane so that their shaped peripheries approach each other to form an aperture of a cross-section corresponding to that desired in the finished toffees with the successive knives **23** protruding into the aperture so as to form indentations in the rod **11**. It will be seen, therefore, that as the rod **11** passes through the aperture, the opposed knives **23** will bite into the rod to form a spaced series of indentations defining a plurality of sections, each series constituting a substantially continuous groove around the rod. After the formation of the indentations, the rod **11** is severed at intervals by the knife **16** across one of the series of indentations, thus producing the severed lengths mentioned above each having a plurality of sections neatly defined by the indentations.

The marking rollers **14** are freely mounted on corresponding shafts **24** secured in bearing members **26**, the lower and centre rollers having their bearing members formed in a common supporting bracket **27** secured to the main frame-work **28** of the machine, while the bearing member **26** of the upper roller **14** is formed in a bracket **29** pivotally mounted at **31** in an extension **32** of the bracket **27** so as to be capable of swinging upwardly for threading or cleaning purposes.

The rollers **14** are driven from a common driving bevel **33** arranged in mesh with a bevel **34** secured to one of the rollers **14**, i. e., the left hand roller in Figure 3, the bevel **34** driving a similar bevel **36** secured to the lower roller **14**. A further bevel **37** secured to the latter roller engages a similar bevel **38** secured to the right hand roller, while another similar bevel **39** secured to the left hand roller drives a bevel **41** secured to the upper roller **14**. The bevels **37**, **38**, **39** and **41** are each formed with annular flanges **42** resting in recesses of similar shape in the corresponding rollers **14** for the purpose of locking the knives **23** in position, the knives fitting in radial slots **43** and being formed with recesses through which the annular flanges **42** pass. As shown in Figure 4, all the bevels **34** to **41** are secured to the rollers **14** in a circumferentially adjustable manner by the provision of slots **44** through which the securing screws pass. Such adjustment provides for a final registration of the marking knives **23** in the event that manufacturing tolerances should cause any slight departure from registration when the various components contributing to the formation of the aperture are assembled.

What we claim is:

1. A mechanism for forming indentations in a moving rod of plastic material, comprising at least three marking rollers rotatably mounted for movement about axes in a common plane, shaped peripheral surfaces on the rollers together corresponding in cross-section with the cross-sectional shape of the rod, the rollers being disposed with opposed portions of their peripheral surfaces together defining between them in axial cross-section an aperture for the passage of the rod and being formed with radial slots at equal circumferential distances and with an annular recess passing through the slots in one face, a marking knife housed in each slot of each roller with its cutting edge lying parallel to the axis of its roller and terminating at the maximum diameter of the roller so as to protrude from the shaped surface of the roller, the knives being formed with recesses corresponding in shape and position with the annular recess in their roller, gearing arranged to drive the rollers at the same peripheral speed with their respective knives arranged on said rollers to move into register with the knives of the other rollers as they pass through the plane in which the aperture is defined, and annular locking members arranged in the annular recesses so as to pass through the recesses in the knives to secure them in position in the rollers.

2. Mechanism as in claim 1, wherein the annular locking members are each constituted by an annular flange on a gear attached to the respective roller.

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