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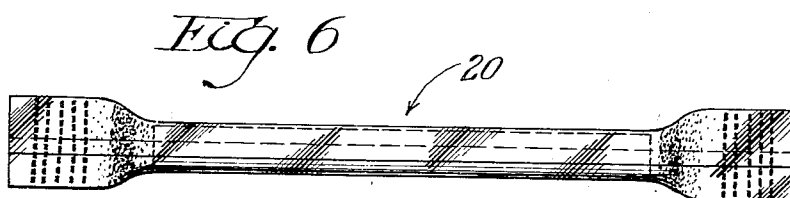
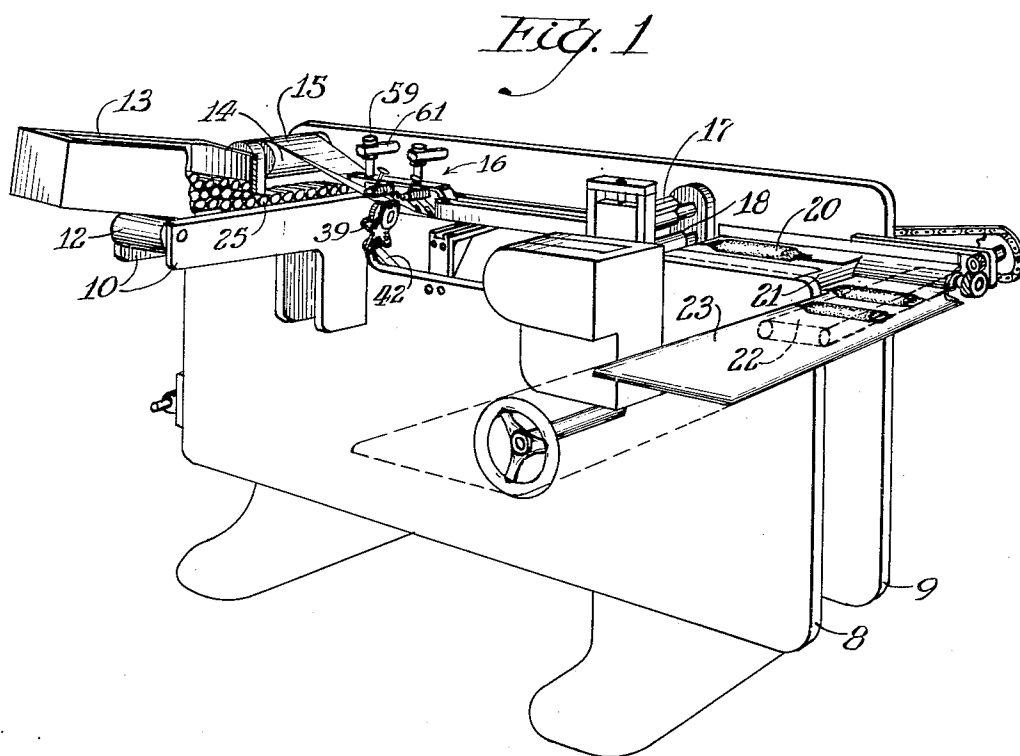
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2,762,178

MACHINE FOR WRAPPING ELONGATED OBJECTS LIKE STICK CANDY

Filed Dec. 22, 1950

5 Sheets-Sheet 1



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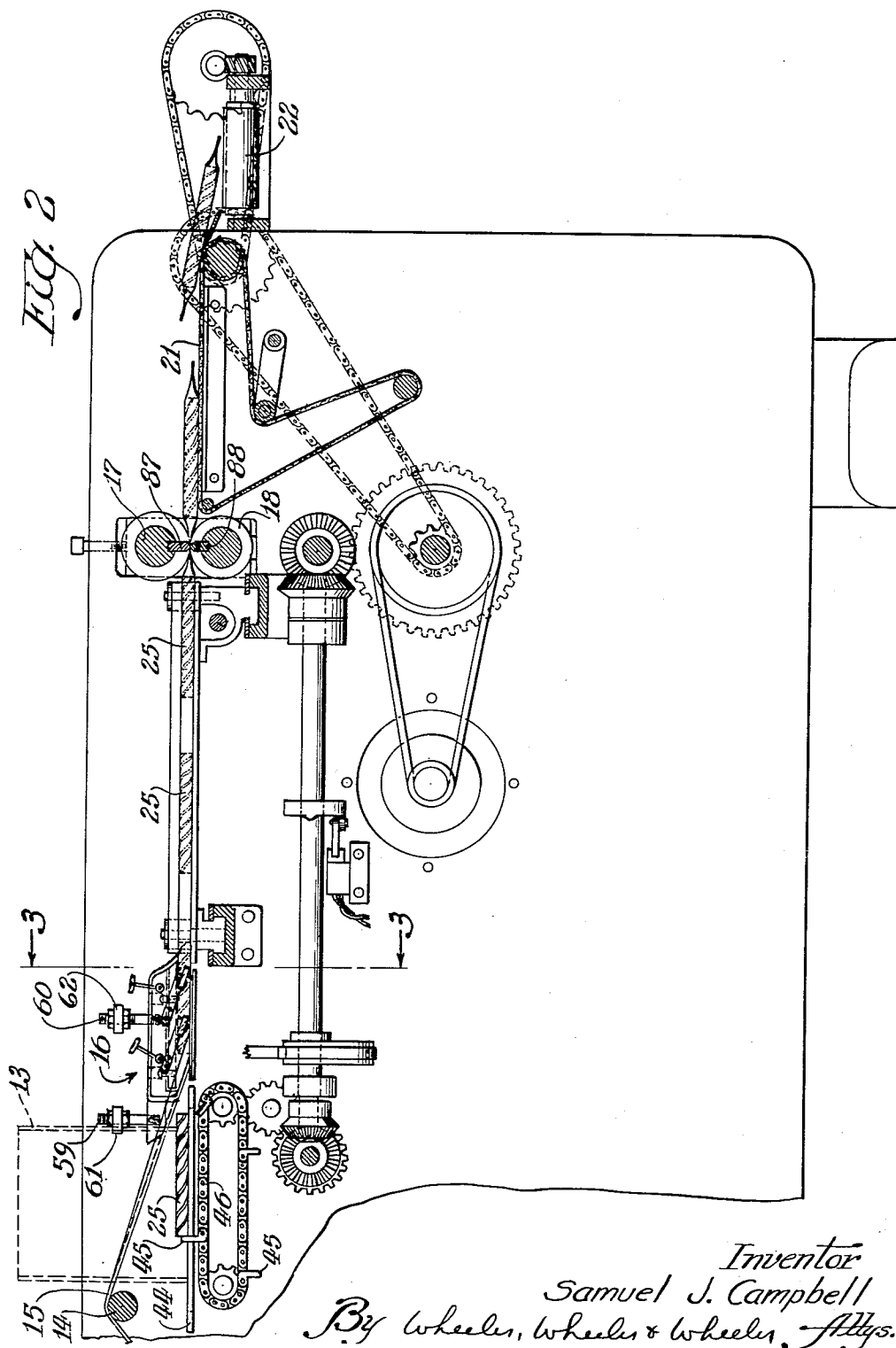
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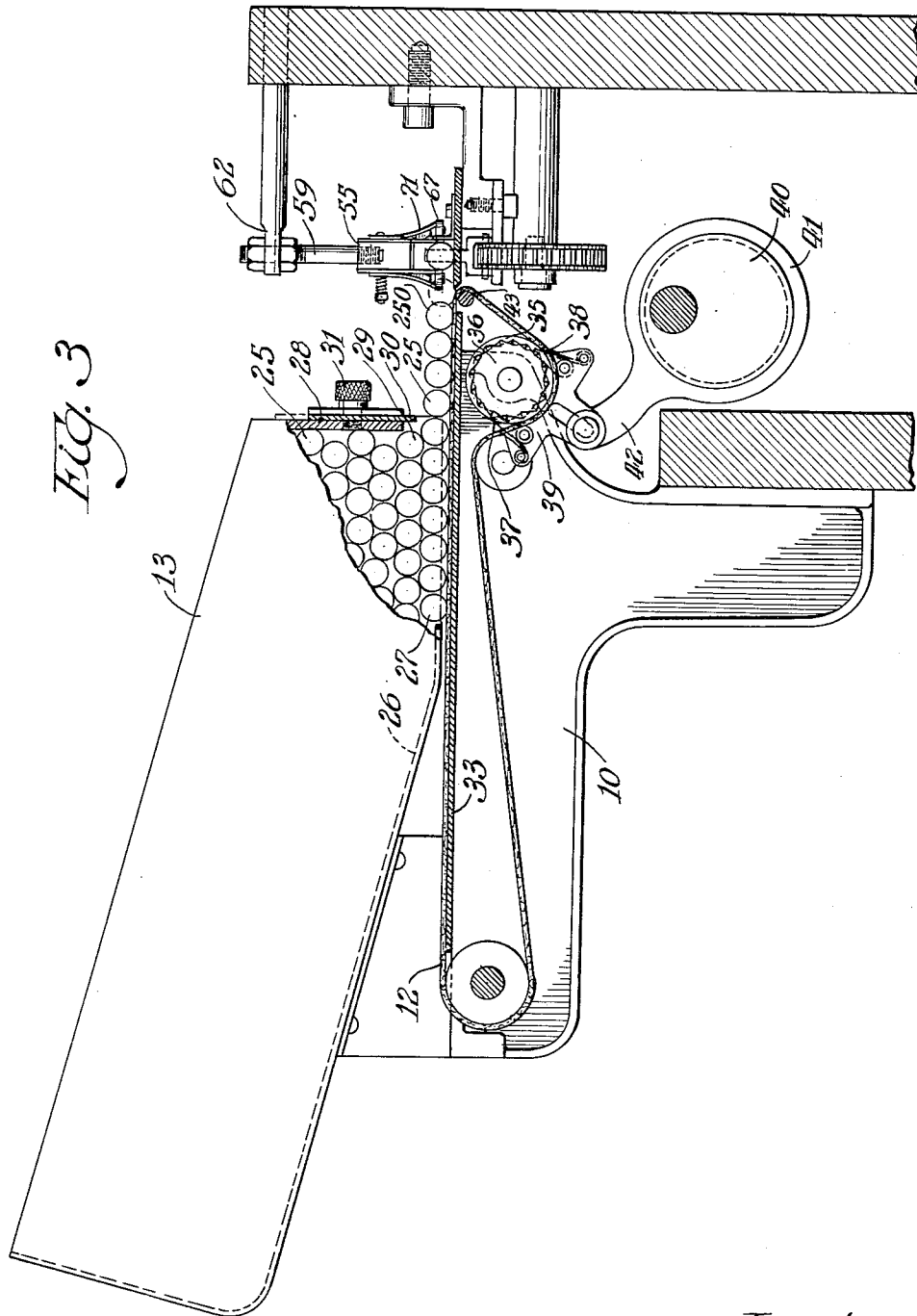
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MACHINE FOR WRAPPING ELONGATED OBJECTS LIKE STICK CANDY

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5 Sheets-Sheet 3



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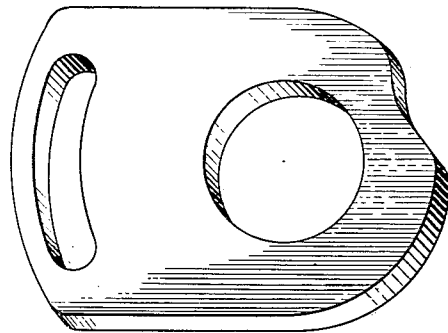
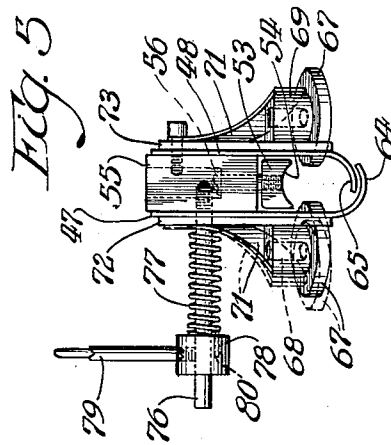
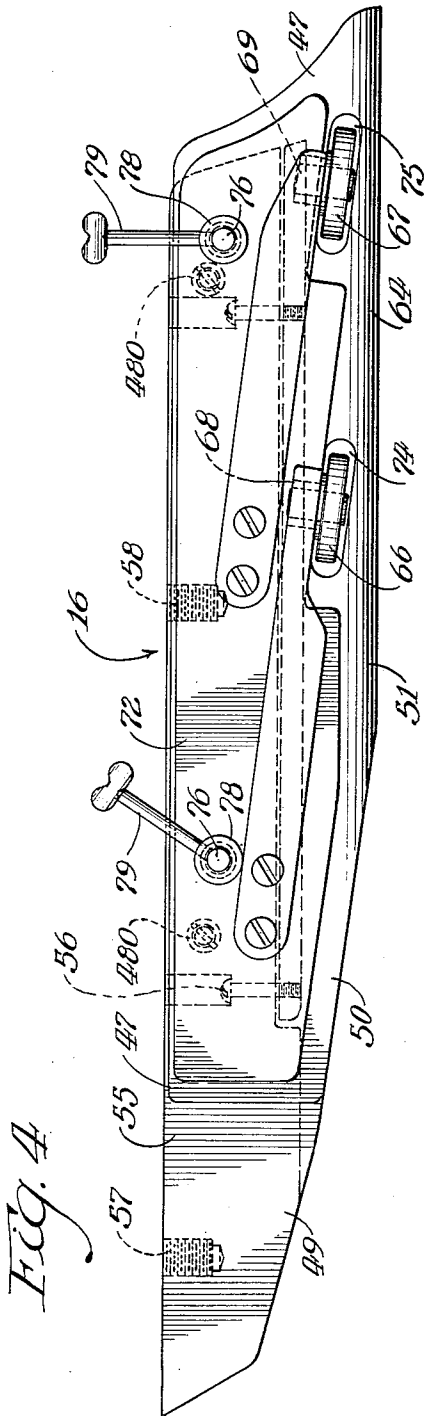
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5 Sheets-Sheet 4



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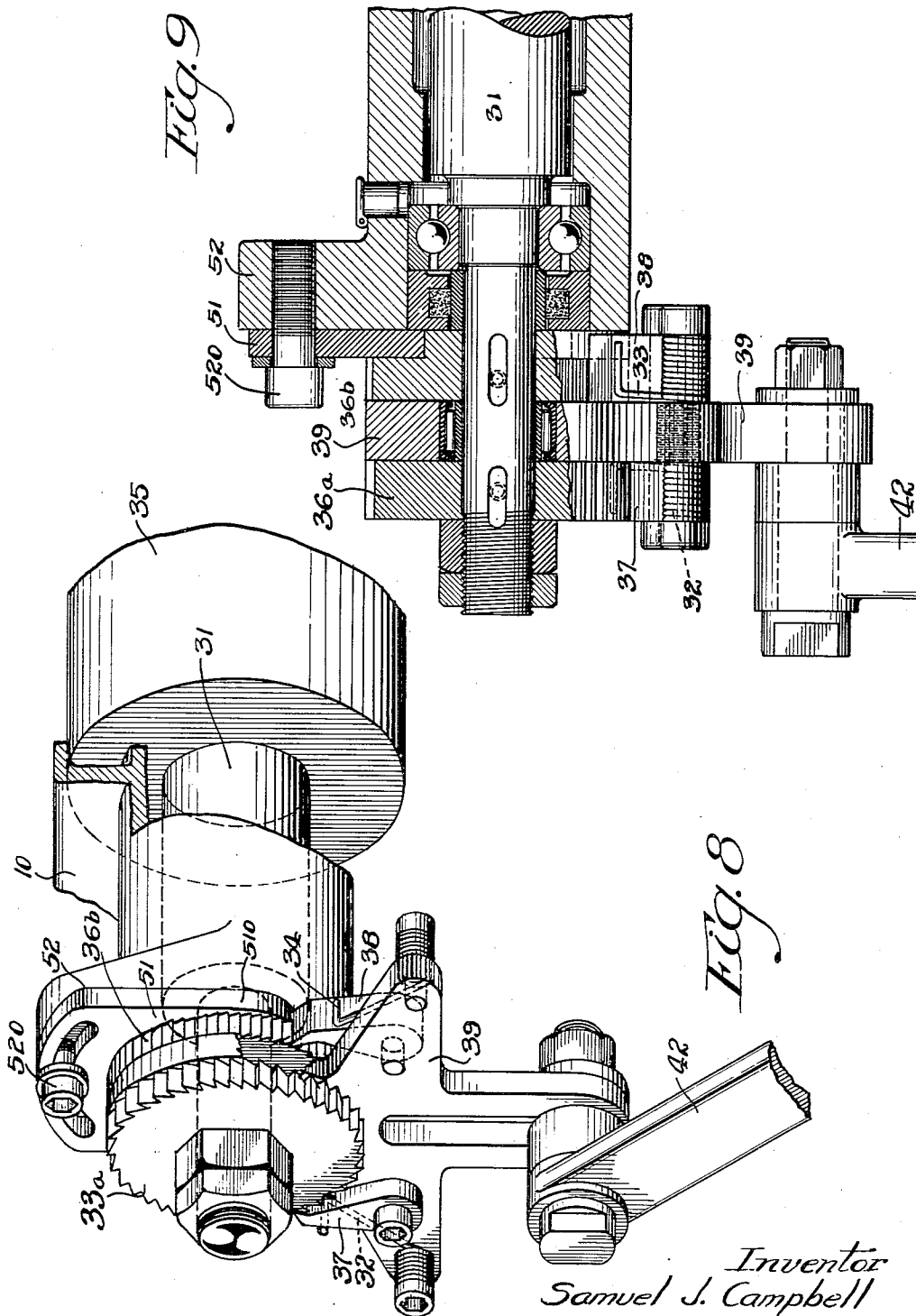
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2,762,178

MACHINE FOR WRAPPING ELONGATED OBJECTS LIKE STICK CANDY

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Application December 22, 1950, Serial No. 202,259

10 Claims. (Cl. 53—182)

This invention relates to a machine for wrapping elongated objects like stick candy. The present application is a companion to my application 650,593 for United States patent on a Wrapping Machine, filed February 27, 1946, now Patent Number 2,602,276, granted July 8, 1952.

As in the case of the companion application above identified, the present machine is of a type in which the objects to be wrapped are fed in from the side onto a conveyor to be passed sequentially beneath the inversely channelled web of wrapping material, wherein the successive objects are enveloped, the wrapping material being marginally lapped beneath the objects, and subsequently severed and sealed transversely at points intermediate the entubed objects, to complete the enclosure thereof. The wrapped objects are then delivered, the delivery being desirably made laterally.

In such a machine, the present invention seeks to provide a type of hopper feed which is especially designed to handle elongated stick-like objects and arranged to deliver such objects singly to the wrapping conveyor. The present invention is further concerned with means for assuring that the inverted channelled wrapping web will be drawn snugly about each successive stick-like object in the entubing operation so that, in the resulting package, the wrapper will tightly conform to the generally cylindrical contours of the wrapped object.

In the drawings:

Fig. 1 is a view in perspective of a wrapping machine embodying the present invention.

Fig. 2 is a view taken in section longitudinally of the wrapping conveyor.

Fig. 3 is an enlarged detail view taken in section in the plane indicated at 3—3 of Fig. 2.

Fig. 4 is a further enlarged detail view in side elevation of the wrapper web channelling former.

Fig. 5 is a view of the former in end elevation from the viewpoint indicated in line 5—5 of Fig. 4.

Fig. 6 is a plan view of the completed package.

Fig. 7 is an end elevation of the package.

Fig. 8 is a view in perspective showing on an enlarged scale a detail of the advancing and retracting pawls for the infeed conveyor.

Fig. 9 is a view in axial section through the parts shown in Fig. 8.

In view of the fact that the machine is of the general type illustrated in the companion application above identified, it requires no detailed description. As shown in Fig. 1, it comprises a machine frame including side members 8 and 9. Arms 10 projecting laterally from side member 8 support the infeed conveyor 12 above which is hopper 13, hereinafter to be described in more detail. The web 15 of wrapping material enters the machine over pulley 14 from a source not shown, and passes beneath the channelled former generically designated by reference character 16 and also more fully described hereinafter.

The cut-off and end closing dies are shown at 17 and 18, and the finished package 20 is delivered by conveyor

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21 onto the discharge conveyor 22 which drops the successive packages onto the laterally projecting table 23.

The mechanisms with which the invention is particularly concerned will now be described.

The hopper 13 is shown in detail in Fig. 3. It has an open top and is of a width roughly corresponding to the length of the candy sticks 25 to be wrapped. These sticks are loaded into the top of the hopper onto the inclined bottom 26 thereof for gravity delivery toward the discharge opening 27 in the bottom of the hopper at its lower end. In the end wall 28 is an opening 29, the height of which may be adjusted by a gate 30 fixed at any desired level by the screw 31. Just sufficient clearance is afforded for the passage of a single stick 25 at a time.

The infeed conveyor 12, to which reference has been made above, operates over the table 33 beneath the hopper and beneath the opening 27 in the hopper bottom. It receives from the hopper a tier of sticks 25, successive sticks descending from the hopper onto the belt 12 to replace those delivered beneath the gate 30 at opening 29.

The belt 12 is intermittently operated. A bight thereof passes around the driving pulley 35 which is mounted on a shaft 31. This shaft carries ratchet disks 36a and 36b having their teeth oppositely directed to be engaged by the pawls 37 and 38. The pawls are pivoted to the operating plate 39 which is supported for oscillation on shaft 31 between the ratchet disks. The respective pawls are mounted on opposite sides of the oscillatory operating plate in registry with the teeth of their respective disks and are biased into engagement with such teeth by the torsion springs 32, 34 shown in Figs. 8 and 9.

The oscillatory operating plate 39 is driven from eccentric 40 through strap 41 and connecting rod 42, the latter being adjustably connected with plate 39 to carry the angular range of plate oscillation.

The spacing between the teeth is such that in each clockwise oscillation of member 39 as viewed in Figs. 3 and 8, the engagement of pawl 37 with ratchet disk 36a causes the belt 12 to be advanced for a sufficient distance to discharge a single candy stick from the delivery end of the belt, where the belt passes around the guide 43. Following this advance, the opposite oscillation of member 39 causes pawl 38 to act on one of the ratchet teeth of disk 36b to retract the infeed belt 12 for a portion of the distance over which it has advanced. The result is that the candy stick 250 which was next behind the stick delivered during the advance of the belt, is retracted slightly from its point of maximum advance, shown in dotted lines in Fig. 3, to the position indicated in full lines in Fig. 3, thus assuring that such subsequent stick will not be engaged by the means which propels the single stick delivered by the belt. In every operation of the belt, it has a sufficient movement of advance to deliver a single stick, this being followed by a belt retractive movement sufficient to effect slight withdrawal of the subsequent stick from the stick delivered.

The exact extent of the retractive movement of the belt 33 is controllable by the cam 51 which is adjustable respecting the frame extension 52, being slotted to receive the bolt 520 as shown in Figs. 8 and 9, whereby the plate is fixed in any desired position of angular adjustment throughout a substantial range.

The axis upon which plate 51 is angularly adjustable is the axis of the disk 36b with respect to which the plate surface 510 is eccentric, as shown in Fig. 8. The ratchet disk 36b is reduced in width to receive the plate and consequently the surface 510 of the cam plate underlies the pawl 38, thereby serving to lift the pawl from engagement with the teeth of ratchet disk 36b when a given degree of rotation of the ratchet disk has been effected by the pawl. By adjusting the cam plate 51, the exact point at which such disengagement will occur can be

predetermined, thus accurately controlling the retractive movement of the belt.

The stick 25 which has been delivered from belt 12 in the manner above described passes onto the wrapping table 44 in the path of one of the lugs 45 of the conveyor 46 which operates beneath the wrapping table with its successive lugs 45 projecting into engagement with the ends of the successively delivered sticks 25. These lugs operate to propel the sticks into the downwardly opening channel which is formed in the wrapping web 15 where the web engages the former 16.

The former, in its general aspects, is described in my companion application above identified. It constitutes a downwardly opening channel with a beveled edge over which the margins of the paper first tend to form upwardly, the said margins subsequently extending downwardly and beneath the workpieces 25 to complete the entubing thereof. The former is illustrated separately in Figs. 4 and 5. There are laterally spaced plates 47, 48 between which the work is confined during wrapping. These plates have the beveled margins shown in Fig. 4 at 49 and 50, the latter having an angle intermediate the angle of margin 49 and the lower margins of the respective plates.

The side plate 48 is fixedly secured to the mounting block 55 by cap screws 480. To permit oversize products to pass without clogging the forming device, the plate 47, and the plate 72, which is carried thereby are bodily yieldable outwardly on the studs 76 against the compression of springs 77, as shown in dotted lines in Fig. 5. The bias of the springs 77 can be adjusted according to the position on each stud of the spring seat collar 78 as determined by the set screw 79. The set screws 79 preferably have wing heads to permit quick removal in the event of jamming. The end of the spring 77 is desirably secured in the collar as shown in dotted lines in Fig. 5 to permit unitary handling.

The top of the channel through which the work passes between plates 47 and 48 is desirably adjustable in a vertical direction, comprising a floating wall 53 having a downwardly opening concave lower face 54. The block 55 which lies between the plates 47 and 48 to close the channelling fixture at its top is socketed to receive the screws 56 which adjustably support the floating wall 53 to allow this to be raised slightly by pressure of the work from its normal position shown in Fig. 5, to which it is biased by gravity. The block 55 has tapped sockets 57, 58 in which are engaged the bolts 59, 60 (Fig. 2), these being adjustably mounted in brackets 61, 62, respectively, for the support of the entire web channelling fixture 16.

The matter of bringing the margins of the paper wrapping web into lapping relationship beneath the article to complete the entubing thereof is solved conventionally by providing the bottom margins of plates 47, 48 with inwardly curving and mutually lapped portions 64, 65, as shown in Fig. 5.

I found it very difficult to draw the paper wrapping web snugly about an article so small in cross section as a candy stick, but solved the problem by the use of obliquely disposed rollers 66 and 67 arranged in pairs and having their respective bearing supports 68, 69 mounted at the free ends of leaf springs 70, 71, the rear fixed ends of which are attached to side plates 72, 73. The paper forming side plates 47, 48 have slots or openings at 74, 75 respectively through which the rollers 66, 67 project into engagement with the wrapping web traversing the former. Since the rollers are disposed to rotate in planes obliquely inclined with respect to the axis of the work, such axis representing the path upon which the work is travelling in traversing the former, the rollers, while turning freely in their own planes, are constantly exerting a frictional component which tends to pull the paper web tightly about the top of each candy stick, drawing all slack to the free margins of the web where it is absorbed

in the lap of such margins beneath the respective work pieces.

As the work pieces 25 entubed in the wrapping material 15 leave the forming device 16, the work pieces are spaced in the tube as clearly shown by the dotted lines in Fig. 2. They pass freely between the upper and lower die rolls 17, 18, but the operation of the die rolls is so synchronized to the conveyor 46 which determines the spacing of the candy sticks that the dies 87 and 88 carried by rolls 17 and 18 come together intermediate the entubed sticks to sever the tubular wrapper between the work pieces therein in the manner shown in Fig. 2. Beyond the point of severance, the wrapped packages are delivered in the manner already described.

I claim:

1. In a machine for wrapping elongated workpieces of small cross section, the combination with a wrapping former comprising side plates having inwardly curved lapping margins and between which workpieces travel upon a predetermined path, of wrapper engaging rolls on opposite sides of said path and disposed to rotate in planes oblique with respect to said path and inclined toward said margins in the direction of workpiece advance, and means supporting said rolls for rotation in positions for contact against said work pieces and intervening wrapper.

2. The device of claim 1 in which the wrapper engaging rolls are yieldably mounted and biased toward said path to urge the wrapper directly into contact with the workpieces.

3. The device of claim 2 in which the rolls are in pairs, the rolls of each pair being substantially in a common oblique plane and their bias being opposed and sustained directly by successive intervening workpieces in their passage on said path.

4. The device of claim 1 in which the roll supporting means is yieldable and comprises springs resiliently biasing the respective rolls toward said path.

5. The device of claim 4 in which the said plates have apertures in which said rolls are disposed for engagement with wrapping material otherwise confined within the former about workpieces to be wrapped.

6. The device of claim 4 in which said yieldable supporting means comprises leaf springs mounted externally of the plates and provided at their free ends with bearings for the support of said rolls.

7. In a device of the character described having a conveyor means for workpiece advance and a wrapper web delivering means whereby a wrapper web is guided above said conveyor in a direction convergent thereto, a former into which conveyor-propelled workpieces and said web are advanced concurrently, said former comprising side plates having their lower margins curved into lapping relationship beneath the path of workpiece advance, and a floating top member between said side plates having its lower surface channelled to workpiece conformation.

8. The device of claim 7 in further combination with laterally yieldable springs, roller mountings connected with said springs to receive inward pressure therefrom and disposed at opposite sides of the path of the workpiece, said mountings comprising bearings forwardly inclined from a position at right angles to such path, and rollers having support in said bearings for rotation in planes downwardly inclined respecting said path.

9. The device of claim 7 in further combination with lateral tensioning rolls for drawing the web snugly about workpieces traversing the former, said rolls being disposed at opposite sides of the former in peripheral engagement with the web and mounted for rotation in planes obliquely convergent downwardly toward the lapping margins of said former side plates, the plates being relieved to give the roll peripheries access to portions of the web within the former.

10. The device of claim 9 in which the rollers com-

prise pairs of opposing rollers substantially in the same plane and each provided with a mounting comprising means biasing the rollers of each pair toward each other.

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