Nov. 7, 1950 H. F. CALDWELL 2,528,856

LABELING MACHINE

Filed Aug. 1, 1949 3 Sheets-Sheet 1

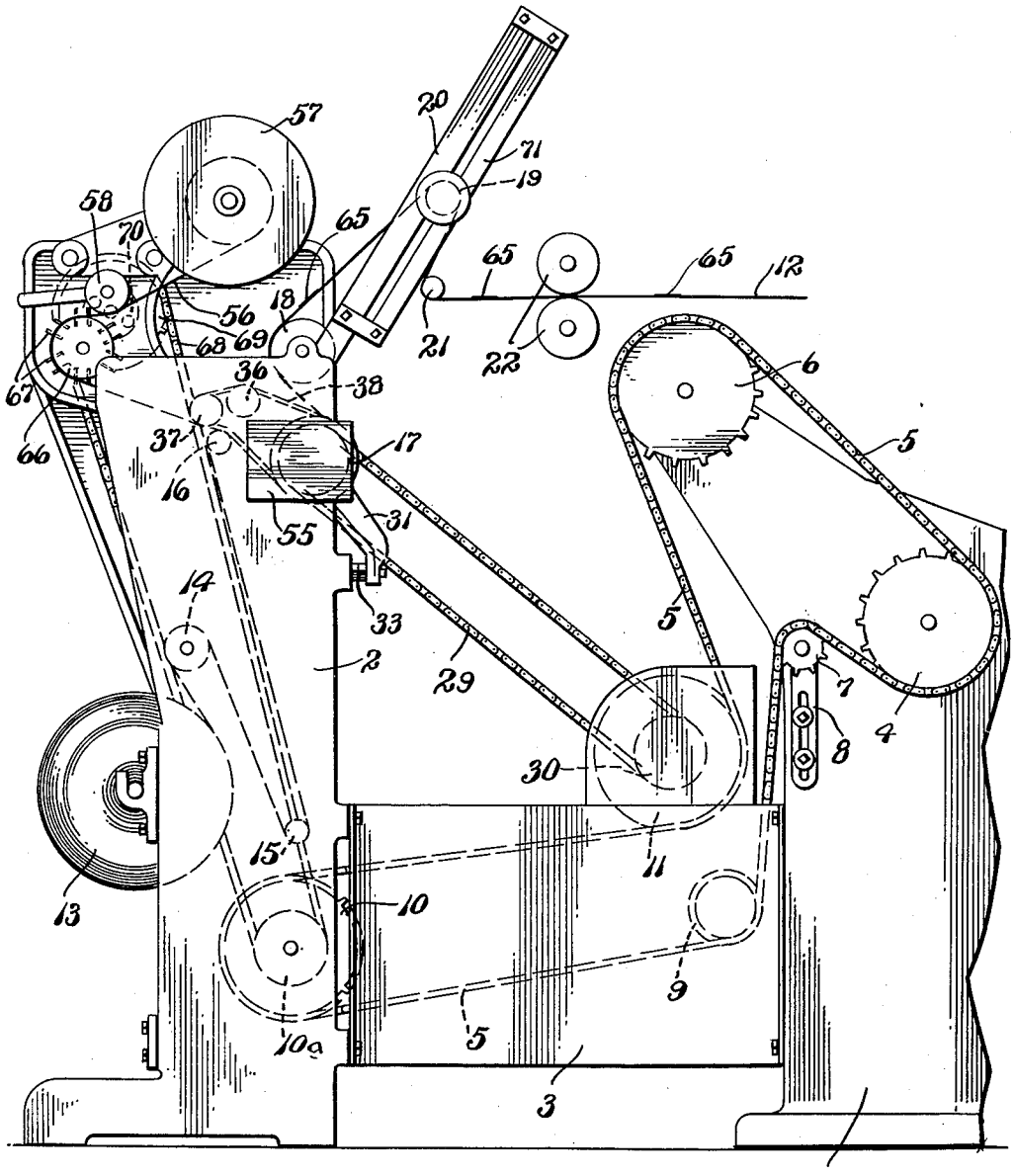


FIG. 1.

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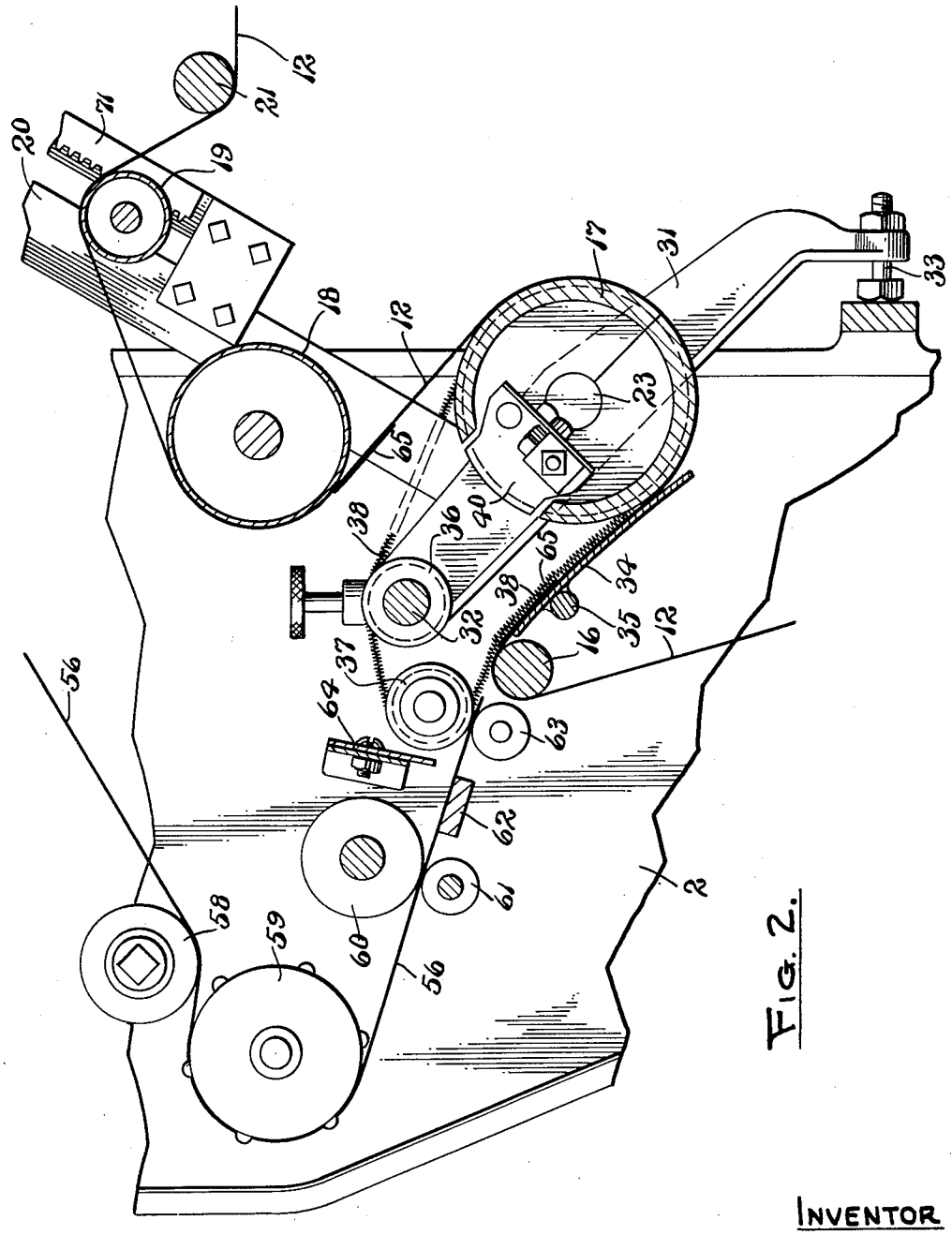


FIG. 2.

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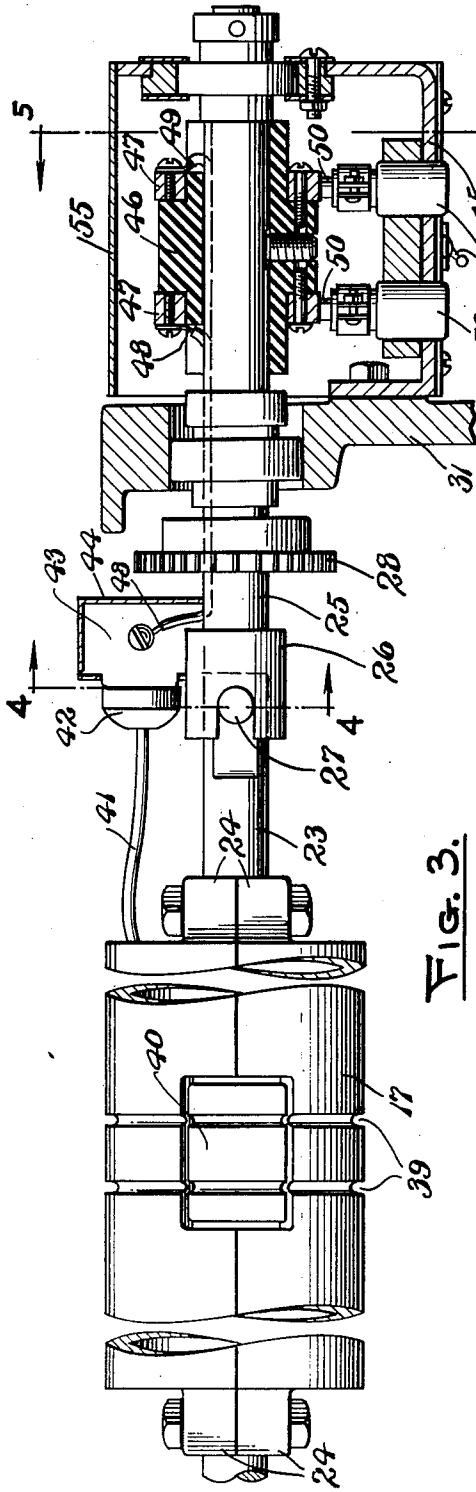


FIG. 3.

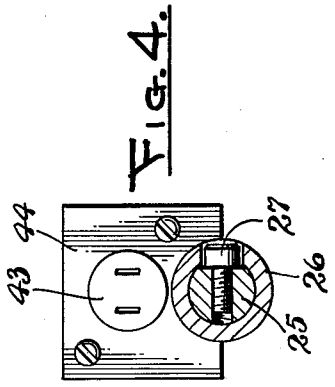


FIG. 4.

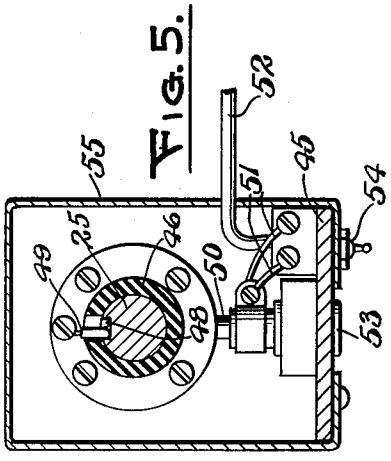


FIG. 5.

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# UNITED STATES PATENT OFFICE

2,528,856

## LABELING MACHINE

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Application August 1, 1949, Serial No. 107,963

7 Claims. (Cl. 216—30)

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This invention is directed to a novel and improved labeling machine.

Many articles of merchandise, particularly food products, or cartons containing the same, are wrapped in wrapping paper for protection of the food products against unsanitary conditions. One food product, bread, is substantially universally wrapped today at the bakeries where produced and is not unwrapped until it is consumed. The loaves of bread or other analogous articles vary in size so that the length of wrapping paper for the different loaf sizes vary.

It is in many cases very desirable that the wrapped articles carry labels, giving information as to the articles or their qualities, and in practice such labels are secured by cementation to the wrapping paper either before or after the wrapping is accomplished. Securing labels to articles already wrapped is disadvantageous; and with my invention the labels are attached to the wrapping paper before it is drawn into the wrapping machine. With different lengths of wrappers for different sizes of loaves of bread or other products which are to be wrapped, the positioning of the labels on the wrappers when attached thereto, so that it will be properly positioned when the wrapper has been applied to the article which is wrapped, has been a difficult problem to overcome particularly as the wrapping should be accomplished very rapidly and expeditiously for purposes of economy.

It is an object and purpose of the present invention to provide a labeling machine in which the desired labels may be permanently secured, usually by the heat cementation of a thermoplastic adhesive at one side of the label to wrapping paper as it is drawn into the wrapping machine from a continuous length of the paper in a roll which paper, in the wrapping machine, is properly cut for the lengths thereof for the articles which are to be wrapped and with such continuous movement of the paper, at proper spaced distances in the length of the paper, labels be attached one to each length thereof which is to be thereafter severed in the wrapping machine and used to wrap a loaf of bread or other article of merchandise. Further, to provide a labeling machine which will thus permanently and securely attach the labels in proper positions on continuous lengths of wrapping paper and which spacing of the labels in the wrapping paper may be controlled for different lengths of wrappers to be used, and also for different positioning of the labels upon the paper so that an accurate desired location of the label on the

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wrapping article is attained in the many sizes of loaves of bread, for example, or other products which are wrapped.

The labels are also in a continuous length and are fed to the wrapper in periodic step by step movements with intervals of time between each movement, the labels being severed one at a time as needed and delivered to the wrapping paper while it is continuously moving. With my invention it is an object and purpose that such periodic delivery to the wrapping paper at proper and accurately spaced time intervals be accomplished, so as to attain in the wrapped article a labeling and a location of each label with respect to its article at a desired position, with no sacrifice of speed of movement of the wrapping paper through the machine and with none of the jar and shock and increase of power required which would occur if, at each attachment of a label, the paper was stopped and thereafter from its stopped position again started in movement and moved only the length of a wrapper before being again stopped for a succeeding label application.

My invention accomplishes the desired results in a very practical, relatively simple and useful manner. The invention may be understood from the following description, taken in connection with the accompanying drawings, in which,

Fig. 1 is a side elevation of the labeling machine of my invention located at one end of a wrapping machine which is fragmentarily shown in side elevation.

Fig. 2 is a fragmentary enlarged vertical section of the upper portion and between the ends of the labeling machine, the section being in a vertical plane longitudinal of the wrapping machine.

Fig. 3 is an elevation, partly in vertical section, of the main roller and its structure of the label attaching mechanism of the machine, showing the novel structure used for supplying heat for the thermoplastic attachment of the label to the wrapping paper, and

Figs. 4 and 5 are vertical sections substantially on the planes of lines 4—4 and 5—5 of Fig. 3, looking in the directions indicated by the arrows.

Like reference characters refer to like parts in the different figures of the drawings.

The labeling machine is located at the wrapping paper entry end of a wrapping machine, the supporting frame of which at such end of the wrapping machine is fragmentarily shown at 1 in Fig. 1. The frame of the labeling machine

has two spaced apart vertical sides 2 connected together by cross bars in a suitable manner, the lower end of the frame sides 2 resting upon the same floor as the lower side of the wrapping machine frame 1. The frame of the labeling machine is spaced a distance back of the wrapping machine and is permanently connected thereto by connecting plates 3 permanently secured at opposite ends to the frames of the wrapping and labeling machines.

Included in the wrapping machine is a driven gear 4 near its rear end, mounted on a suitable driven cross shaft, which continuously drives an endless chain 5. The chain 5 from the wheel 4 extends upwardly and over an upper change direction and idle wheel 6. The chain 5 passes underneath the wheel 4 over a small wheel 7 which is mounted for vertical adjustment for taking up slack and tensioning the chain on a slotted bar 8 bolted to the side of the frame 1. Chain 5 is thence directed downwardly around and underneath an idle wheel 9 and therefrom and underneath and thence over a wheel 10 which is mounted on the lower portion of the frame 2 of the labeling machine, it being understood that all of the wheels have suitable horizontal cross shafts to which they are attached. From the wheel 10, chain 5 extends underneath and around and upwardly around a wheel 11 carried on a shaft which is suitably mounted upon a support above the plates 3, from which said chain extends upwardly to and over the previously described wheel 6. The several wheels 4, 6, 7, 9, 10 and 11 in the operation of the wrapping machine are continuously driven.

The wrapping paper 12 to which the labels are to be applied, initially in a continuous roll 13 is carried at the back of the label machine support 2 in a horizontal position. The paper is unwound from the roll, passing upwardly and over a guide change direction roller 14 and thence downwardly underneath a second roller 15, thence upwardly over a third roller 16 which is located at substantially the same vertical height and a short distance back of the label attaching station of the mechanism hereafter described. From the roller 16 the paper is carried downwardly and under and thence upwardly around the label affixing roller 17 and therefrom, passes over an idle roller 18 and thence over and under respectively the succeeding rollers 19 and 21. The roller 19 is mounted for an adjustment upon an inclined frame support 20 connected with the label machine. From underneath the roller 21 the paper passes through upper and lower rollers 22 (Fig. 1) on its way to the bread wrapping machine. During its passage through the labeling machine the labels are attached, so that in the process of wrapping the bread in the wrapping machine, the paper is cut across to provide the necessary length for a wrapper and, with a label attached, is wrapped around the bread or other article which is to be wrapped.

The roller 17 is made up of two halves (Fig. 3) which are affixed to a shaft 23, each end of each half of the roller having a projecting lug 24. The lugs at each end of the two part roller are releasably clamped together to fix the roller on the shaft. Shaft 23 is in alignment with a second shaft 25. Shaft 25 carries a sleeve 26, one end of which projects beyond the end of the shaft 25, slotted in one side. Shaft 23 enters the projecting end of the sleeve and has a headed screw 27 (Fig. 4) which is received in the slot of the sleeve to thereby, in effect, clutch connect the shafts together. On the shaft 25 a chain wheel 28 is secured which is driven by an endless chain 29 (Fig. 1) from a driving wheel 30 on the same shaft as the wheel 11, which wheel is driven from the wheel 4 of the bread wrapping machine.

The outer ends of the shaft 23 are mounted in suitable bearings on and between the ends of levers or bars 31 which have a rocking mount at their upper ends upon a cross shaft 32 between the side 2 of the label frame, and extend downwardly and toward the bread wrapping machine. At their lower free ends they carry adjusting screws 33 the heads of which bear against the frame sides 2 for an adjustable change of position. Between the rollers 16 and 17 a plate 34, extending substantially from one to the other, is mounted on a shaft 35 so that it may be adjusted to follow the positions of the roller 17. Above this plate and to one side of the roller 17 are grooved rollers 36 and 37, the roller 36 being mounted on the shaft 32. The grooves in the rollers 36 and 37 are of the same depth as the grooves 39 in roller 17, shown as two in number (Fig. 3). Endless belts 38 in the form of continuous coiled wire springs pass around the several rollers 36, 37 and 17 and are driven by the roller 17 so that the lower run of the belt moves in the same direction as the movement of the wrapping paper 12 and at the same speed of movement.

A heating element 40, which is electrically heated, is mounted in one side of the two-part roller 17 as shown in Figs. 2 and 3, it having an outer surface of the same curvature as the outer surface of the roller and also having grooves corresponding to 39. A conductor 41 for conducting electric current to the heating element is connected at one end with said element and extends beyond an end of the roller 17 to a plug 42 which has a detachable connection with a socket 43 housed in a housing 44, the socket and its housing being secured to and rotating with the shaft 25.

The shaft 25 at one end extends through its supporting arm 33 in which it has rotatable mounting and through a bracket 45 which has a horizontal lower portion and a vertical outer end portion in which a bearing is located for the end of the shaft 25. A collar 46 of insulating material is fixed to the shaft 25 beyond the adjacent arm 31, on which are two metal rings 47 spaced from each other, from which wires 48 and 49 lead to the opposite sides of the socket 43. The rings 47 are in contact engagement with brushes or contacts 50 carried on and suitably insulated from the bracket 45, which have wire connections 51 (Fig. 5) with a cable 52 which carries two wires for the conducting of current to the wires 51 thence to the brushes 50, the collars 47 and the two wires 48 and 49 to the socket 43. Shaft 25 is longitudinally grooved and in the groove the two wires 48 and 49 are located (Figs. 3 and 5). The brushes 50 are carried by suitable insulating supports 53 and a sheet metal housing 55 covers the mechanism described.

The labels are in a continuous strip 56 which, in a roll, are carried by a reel 57 at the upper end of the labeling machine. The strip passes under an idle and guide roller 58 and then over a drum 59 which, as shown in Fig. 2, has projections extending therefrom to engage with notches or openings in the label in accordance with the usual or well known method of moving paper in lengths used not only in labeling ma-

chines, but in winding and unwinding reel films and the like. From the under side of the roller 59 (Fig. 5) the label strip passes between upper and lower rollers 60 and 61, and thence over a bar 62 to a roller 63 which is directly underneath the previously described roller 37. The bar 62 serves as a cutter bar in association with a movable blade 64 which is periodically actuated to sever the label strip transversely and cut from it successive labels 65. The mechanism for actuating the blade is not shown as it is old and well known in labeling machines for the same general purpose as the present machnie. On the same shaft as the roller 59, a wheel 66 is secured which has radial vanes extending therefrom. A chain 68 is driven from a wheel 10*a*, on the same shaft as the wheel 10, passes around an upper wheel 69 to drive it, on which is a disk 70 having pins projecting therefrom at opposite sides of the axis of rotation for engaging with the vanes 67 to turn the wheel 66 at periodic spaced apart intervals. The Geneva movement disclosed is one of the several forms of Geneva movement which may be used, such periodic turning of one shaft and whatever is connected with it from a shaft which is rotating continuously by a Geneva movement being well known.

It is apparent that, with the driving wheel 4 from the bread wrapping machine driving the shaft on which the rollers 10 and 10*a* are mounted continuously, the labels are unwound from the reel 57 at spaced intervals of time. The design of the mechanism is such that with each turning of the wheel 66 and the drum 59 on the same shaft therewith, the length of a label is unwound from the reel 57 and upon the severing of the label by the knife 64, the severed label 65 is gripped by the rollers 63 and 37 and carried to the paper, bears thereagainst and is held against the paper by the spring belts 38 during all of the time of its passage from roller 16 until it leaves the roller 17.

The roller 19 is adjustable lengthwise of the frame at 20 to different positions one being shown in Fig. 1 and one in Fig. 2. The frame includes a rack bar 71, and the shaft of the roller 19 has a gear in engagement therewith so that by turning the shaft the rack 71 may be traversed to a selected position and the shaft then secured in such position.

In the operation, with the wrapping paper 12 moving continuously, there is deposited at equally spaced intervals in the length of the paper, successive severed labels 65, the labels being cut in succession from the end of the label strip 56. Each label when severed is moved by the rollers 37 and 63 between the continuous length of wrapping paper 12 and the lower runs of the belts 38, such belts hold the labels against changing position on the wrapping paper after delivery to it.

As the movement of the paper 12 continues, the labels are brought in succession with the roller 17, and heat is supplied from the heating element 40 directly to one side of the label, the opposite side of which, being coated with a thermoplastic cementitious material, such material is softened and the label is securely cemented to the paper. Such labels therefore are equally spaced distances from each other in the length of the continuous length of wrapping paper 12, which paper with the attached labels goes to the wrapping machine where it is severed transversely in proper lengths to provide wrappers for articles which are to be wrapped, each length of paper comprising the wrapper for an article having a label attached thereto.

The roller 17, in the use of the machine, may be interchanged for one of a larger or smaller diameter. The shaft 23 with the roller secured thereto is readily removed by a lengthwise movement of the shaft after disconnection of the plug 42 from the socket 43. Either the roller on the shaft 23 may be replaced by another having a different diameter, or there may be assemblies of identical shafts 23 with rollers of differing diameters and heating elements, one roller secured to each of the separate shafts 23. When a different size of roller is put in the machine, the plate 34 is tilted on rod 35 to occupy the same relative position to the different roller 17 and the paper 59. As the rotative speed of the shaft 23 remains constant, and one label is attached to the wrapping paper with each revolution of the roller 17, it is apparent that different diameters and circumferences of the rollers provide for different lengths of wrapper for the articles to be wrapped. The adjustment of arms 31 by screws 33 is for properly positioning the roller shaft and shaft 25 to parallel the other shafts 15, 32, etc.

The adjustment of the roller 19 upon its carrying frame 20 is for properly locating each label upon its respective length of wrapping paper which is to be cut from the continuous length of paper for wrapping an article in the wrapping machine. A loaf of bread for example should have the label located as centrally as possible at the upper side of the loaf between opposite sides. Such adjustment of the roller 19 will vary the position of a label on the paper as it enters the wrapping machine, and such variation or differences in position may be adjusted and controlled so that the label will appear on the wrapped article at the place desired.

The rotation of the electric current carrying mechanism with the roller 17 and the breaking or completion of the circuit provided by the plug 42 and socket 43 insures that the heating element 40 shall be heated at all times by the current supplied and that the roller 17 may be replaced by others when needed.

The construction described is novel and very useful, and there is eliminated any shock or jar of periodic stopping and the overcoming of inertia by starting the label machine in operation after such stopping. The maximum attachment of the labels to the wrapping paper in a given time is obtained.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a structure as described, a support adapted to be connected with and located at one end of a wrapping machine, a horizontal roller mounted on said support, means for continuously driving said roller, means for conducting and carrying wrapping paper mounted on said support to and partly around said roller and away therefrom, means driven by the same driving means which drives the roller for periodically supplying labels one at a time to said moving wrapping paper at equally spaced distances in the length thereof a short distance from and prior to the wrapping paper reaching said roller, and a heating element mounted on said roller synchronized in movement to bear against each label as the paper and labels thereagainst moves around said roller, said labels carrying each an

adhesive at the sides thereof against the paper, rendered adhesive by the application of heat.

2. A structure as defined in claim 1, endless belts around said roller, additional rollers spaced from said first mentioned roller around which said belts pass, and a support over which the paper moves located adjacent the first roller and extending away therefrom over which the paper and belts pass, the labels being delivered to the wrapping paper between it and said belts to hold the labels against change of position on the paper.

3. A structure as defined in claim 2, said roller and additional rollers having grooves in which said belts seat, and said belts being of a coiled wire elastic construction, and said heating element extending to the surface of the first roller and having grooves therein in alignment with the grooves in said roller, whereby the outer surface of said heating element presses against the labels in succession as they come to said heating element.

4. A structure as defined in claim 1, a shaft on which said roller is fixed, an aligned driven shaft to which the roller shaft is detachably connected, said heating element being electrically heated, a cable having a connecting plug thereon connected to and supplying electric current to the heating element, a socket mounted on the driven shaft to which said plug has detachable connection, rings mounted on and insulated from the driven shaft, electrical connections between said rings and plug, and fixed brushes bearing against said rings combined with means connecting said brushes to a source of electric current.

5. In a label machine, a vertical support adapted to be located adjacent one end of a wrapping machine and secured in fixed position relative thereto, a horizontal roller mounted on said support, means for continuously driving said roller, means for directing and guiding a continuous length of wrapping paper on said support and directing said wrapping paper in a downwardly inclined direction underneath the roller and around it and thence in an inclined direction upwardly and away therefrom, a plate having one end located adjacent said roller extending therefrom in an upwardly inclined direction, over which said paper moves to the roller, means for periodically delivering labels in succession to the upper side of the paper at spaced distances in the length thereof, each at a short distance from said roller, movable means moving at the same speed of movement as said paper engaging said labels and holding them against the paper until the roller is reached, a heating element mounted on said roller and having a surface concentric with the surface of said roller against which said label is pressed by the paper, electric means for heating said heating element, and means for conducting electric current to said heating element while the roller is rotating.

6. In a labeling machine, a support having spaced sides, a roller between said sides of the support, a shaft extending through the roller, a second shaft in alignment with the first shaft detachably connected therewith, a heating element carried by said roller and having a curved surface at its outer portion of the same arc of the curvature and of a continuation of the surface of said roller, means for supplying said heating element with electric current, means for guiding and carrying wrapping paper to and over a position spaced a short distance from the under portion of the roller, and therefrom under the roller and upwardly around it and thence upwardly and away from the roller, means for depositing a label on said wrapping paper with each rotation of said roller in a position to be located between the paper and said heating element while the paper is in engagement with said roller, and means for driving said second shaft to thereby drive said roller through the connection of its shaft with the second shaft.

7. A structure as defined in claim 6, said second shaft having two rings connected with and electrically insulated therefrom, brushes engaging one against each of said rings, current supplying conductors connected one with each brush, and plug and socket connections one connected with the heating element and the other with said second shaft for detachably connecting said heating element with said rings.

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