

Aug. 15, 1967

O. NIEPMANN

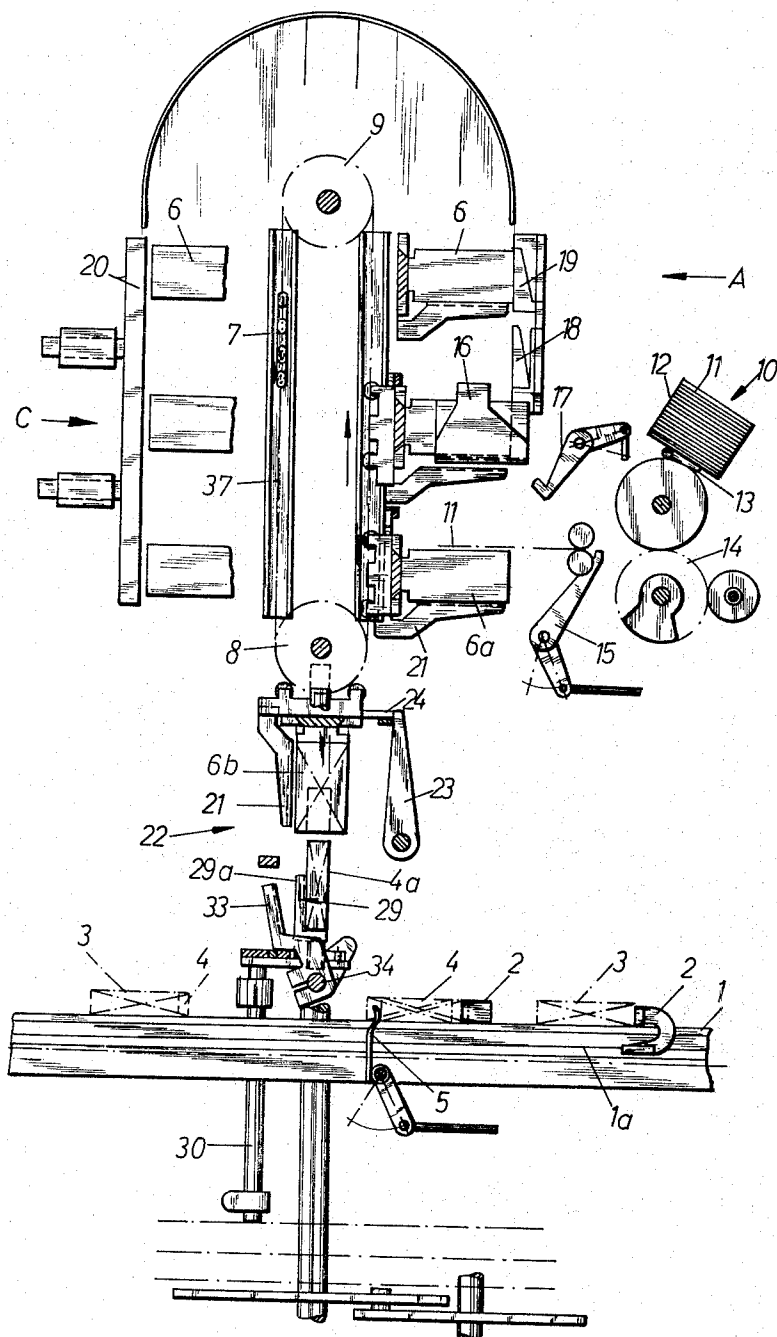
3,335,644

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APPARATUS FOR MAKING WRAPPINGS IN A WRAPPING
MACHINE, ESPECIALLY FOR CIGARETTES

Filed March 24, 1964

6 Sheets-Sheet 1

Fig. 1



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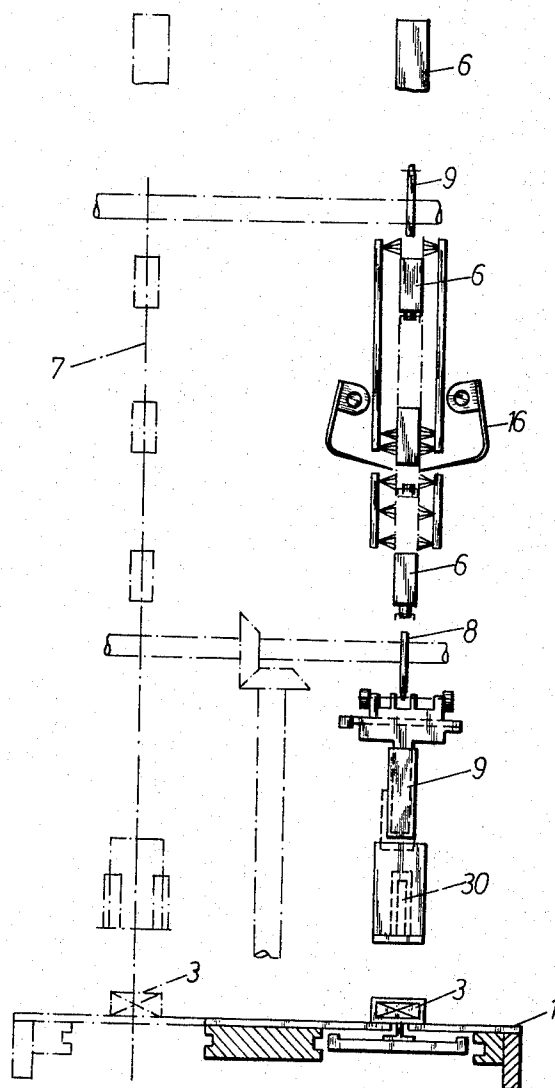
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Fig. 2



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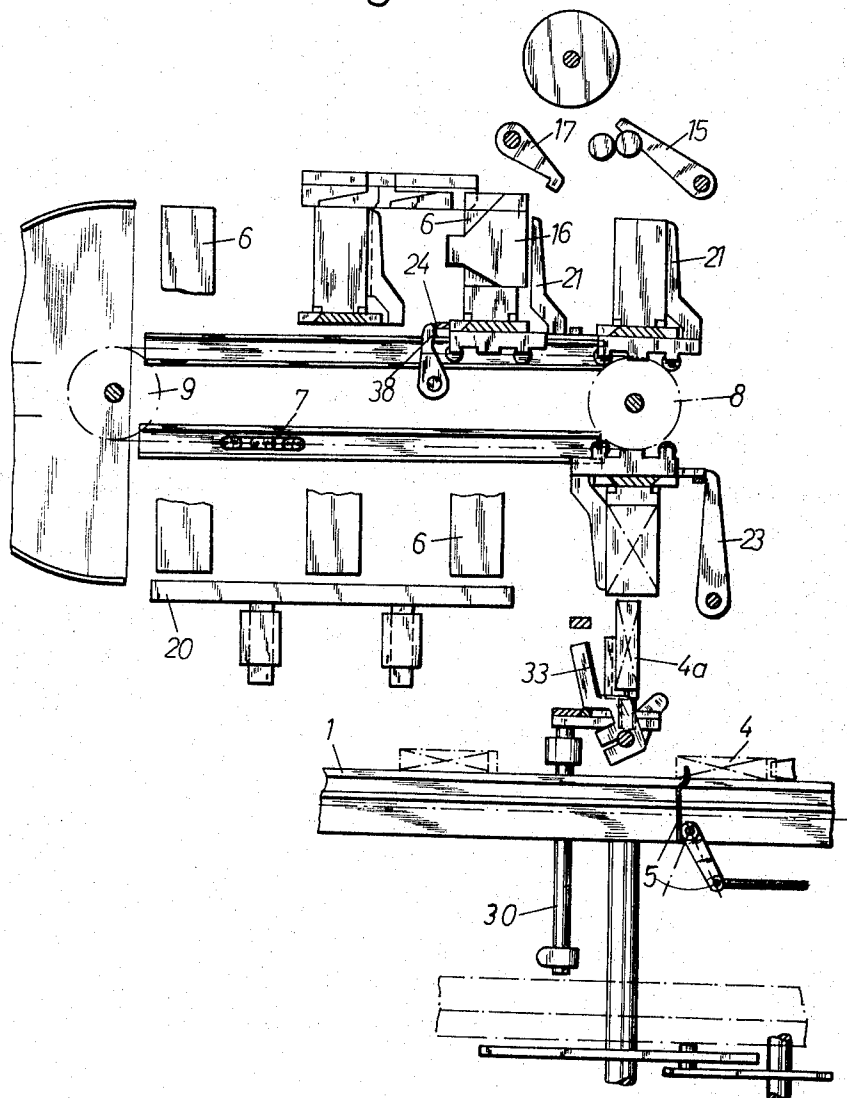
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Fig. 3



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Fig. 5

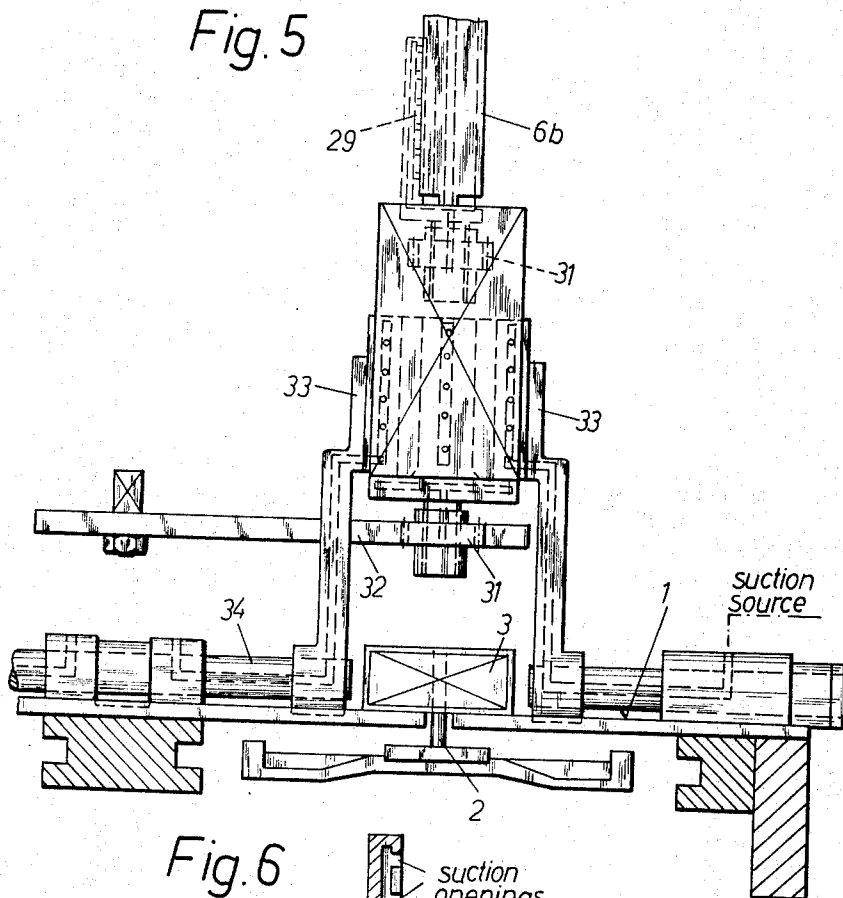
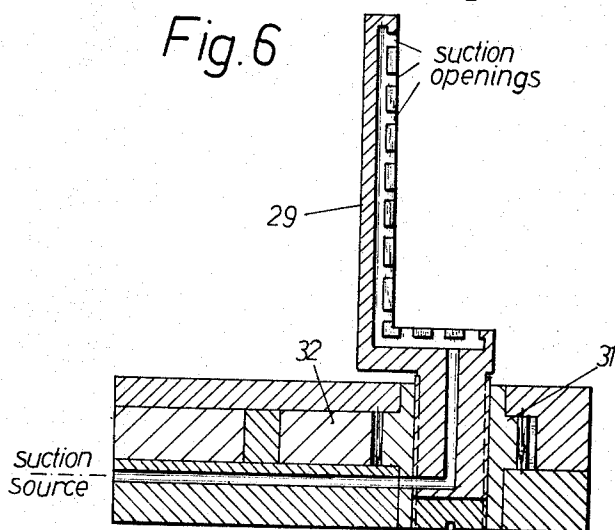


Fig. 6



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MACHINE, ESPECIALLY FOR CIGARETTES

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Fig. 7

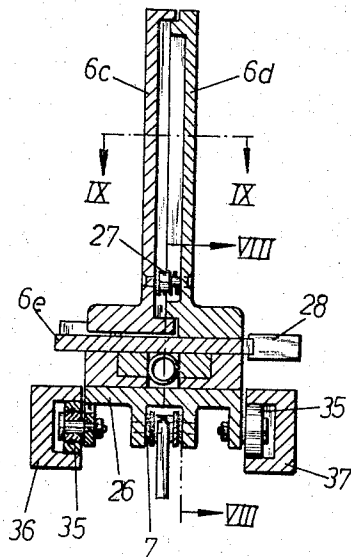


Fig. 8

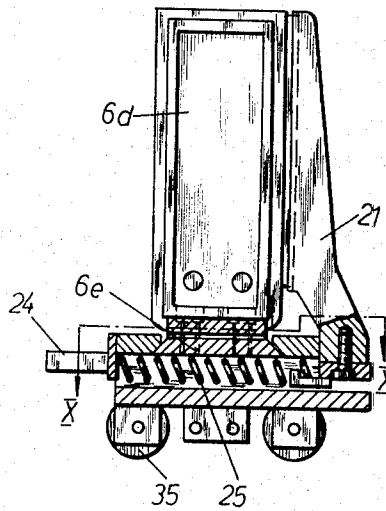


Fig. 9

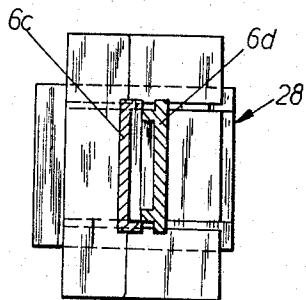
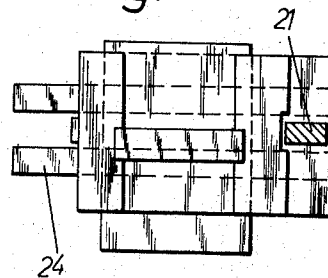


Fig. 10



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APPARATUS FOR MAKING WRAPPINGS IN A WRAPPING MACHINE, ESPECIALLY FOR CIGARETTES

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15 Claims. (Cl. 93—12)

The present invention relates to an apparatus for making wrapping, especially for wrapping cigarettes and similar articles, while employing a wrapping which is completed prior to the filling thereof and which has a bottom fold.

In connection with arrangements of this general type it is known to introduce cigarettes in a direction perpendicular to the direction of movement of such wrappings. The heretofore known machines used for this purpose are provided with a circulating device equipped with folding mandrels for making the wrapping and are also provided with conveying means for conveying the material to be wrapped. Heretofore the wrapping was produced on turret heads equipped with folding mandrels. These turret heads are located in a plane which is perpendicular to the conveying path for the goods to be wrapped and located above said conveying path. Inasmuch as with these arrangements the necessary devices for withdrawing and feeding the cuts for the wrappings are located laterally of the turret heads, the wrapping forming device of the wrapping machine becomes unusually wide. Aside from the considerable space requirement, these heretofore known arrangements have the further disadvantage that the device for making and feeding the wrapping to a material receiving station is not easily accessible which makes itself felt particularly when a plurality of conveying paths or conveying means are required.

It is, therefore, an object of the present invention to provide an apparatus for preparing wrappings, especially for cigarettes, which will overcome the above-mentioned drawbacks.

It is another object of this invention to provide a wrapping forming apparatus which for all practical purposes does not require more space than the transporting device for the goods to be wrapped.

It is still another object of this invention to provide an apparatus of the type set forth above, which will make the wrapping mechanism easier accessible than with heretofore known devices of the type involved while reducing the width of the entire apparatus.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 is a diagrammatic side view and partly a section of an apparatus according to the present invention.

FIG. 2 is a front view of the device of FIG. 1 as seen in the direction of the arrow A.

FIG. 3 represents a modification over the arrangement of FIG. 1 and differs therefrom primarily in that the chain for conveying the wrapping mandrels has a location turned by 90° over that of FIG. 1.

FIG. 4 shows the lower half of FIG. 1 on a larger scale than the latter and in particular illustrates the transferring, withdrawing and tilting mechanism of the apparatus of FIG. 1.

FIG. 5 shows the front view of the tilting device of FIG. 4 as seen in the direction of the arrow B.

FIG. 6 illustrates a detail of a turning device used in connection with the apparatus of FIG. 1.

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FIG. 7 represents a section through a wrapping mandrel.

FIG. 8 illustrates a section taken along the line VIII—VIII of FIG. 7.

FIG. 9 is a section taken along the line IX—IX of FIG. 7.

FIG. 10 is a section taken along the line X—X of FIG. 8.

The apparatus according to the present invention is characterized primarily in that the folding or wrapping mandrelse are arranged on conveying means, as for instance an endless chain, which circulates in a vertical plane immediately above a conveyor path.

Referring now to the drawings in detail and FIG. 1 thereof in particular, the apparatus illustrated therein represents a cigarette wrapping machine which in customary manner comprises a sliding path 1 in which there is provided a chain 1a with catches or dogs 2 for the tin foil wrappings 3. Such tin foil wrapping is in a manner known per se to be wrapped by a wrapping 4 of paper. To this end, the wrapping 3 is inserted into the wrapping 4 which is open at one end. Wrapping 4 is likewise in a manner known per se held for a short period of time by a controllable abutment 5. The tin foil wrapping 3 together with wrapping 4 still open at one end is in conformity with FIG. 1 displaced further toward the left to a station in which the open end of wrapping 4 is folded likewise in a manner known per se.

For purposes of forming the wrapping 4, a device is employed in which the folding mandrels 6 which heretofore were mounted on a turret head, are arranged on a circulating chain 7. Chain 7 is passed around a lower deviating roller 8 arranged above the withdrawing station generally designated with the reference numeral 22. The second or upper deviating roller 9 is in conformity with FIGS. 1 and 2 arranged in spaced relationship to and above roller 8. In order to facilitate the feeding of the wrapping material, for instance the cuts for the wrapping, the broad sides of the folding mandrels are arranged parallel to the plane of the path of movement of the mandrels. At one side of the straight portion of the chain there are arranged the feeding device for the wrapping and also the customary folding thumbs, longitudinal folder and the folding cams. On the other side of the chain path there is provided a pressing and heating strip extending over a plurality of stations and intended for closing the bottom of the wrapping. More specifically, a feeding device 10 for feeding the blank 11 for the wrapping is arranged on the right-hand side of the right-hand reach of chain 7. The feeding device comprises a magazine 12 receiving the blanks which are withdrawn by a suction device 13 and by means of a glueing segment 14 are covered with an adhesive in a well known manner. By means of a controlled lever 15 the blank 11 is transferred to a mandrel 6a. When the chain 7 is advanced by one step, mandrel 6a moves to the longitudinal fold producing means 16 and from there to a lateral folding thumb 17. By means of folding cams 18 and 19 or the like one side of the wrapping is folded in a manner known per se. The mandrels will then by means of chain 7 pass over the deviating roller 9 to the descending reach of chain 7. Alongside said descending reach there are provided pressing and heating strips 20 which extend over a plurality of stations and are adapted to be moved in the direction of the arrow C for exerting closing pressure upon the wrapping bottom and for drying the adhesive thereon.

Adjacent each folding mandrel 6, the chain 7 supports a spring-urged paper holder 21 which after the longitudinal fold has been formed rests upon the glueing seam and exerts pressure thereon until the wrapping has reached the withdrawing station 22. Below the chain path there

is provided a wrapping withdrawing device 29 which is adapted to withdraw the wrapping from the folding mandrel and to turn said wrapping by 90° about its central axis. Adjacent said withdrawing device there is provided a tilting device for tilting the wrapping after it has been turned by 90° into the conveying path of the material to be wrapped. The wrapping withdrawing device and the tilting device may be designed as air suction means.

As will be seen from the drawing, the withdrawing station 22 comprises an oscillatable controlled lever 23 adapted to act upon a carriage 24 which in its turn moves the holder 21 against the thrust of a spring 25 (FIG. 8) toward the left with regard to FIG. 1 in order to move the holder 21 away from the wrapping (FIG. 4).

For purposes of facilitating the withdrawal of the wrapping, each folding mandrel may be composed of a stationary and a displaceable part so that when withdrawing the wrapping from the mandrel, the overall size of the mandrel may be reduced by displacing the displaceable part. The displaceable mandrel part is at the withdrawing station adjustable by means of a fixed cam or the like with regard to the stationary mandrel part.

The two mandrel parts are shown more clearly in FIGS. 7 to 10. As will be evident therefrom, the stationary or fixed mandrel part is designated with the reference numeral 6c and is fixedly connected to the mandrel support 26. The displaceable mandrel part 6d is movable relative to part 6c. The foot portion 6e of the mandrel is slidably arranged and is adapted to be displaced on part 6c against the thrust of a spring 27 when mandrel 6 moves in the withdrawing device 22 against a cam 28. In this way, the mandrel will during the withdrawing operation have a smaller overall size than is the case when the wrapping is formed, so that the withdrawing of the wrapping will be greatly facilitated. As will be seen from FIG. 7, each holder 26 connected to chain 7 carries four rollers 35 which are guided in U-shaped rails 36 and 37. This assures a very precise guiding for the mandrels 6.

The withdrawing device 29 comprises a withdrawing angle 29a adapted operatively to be connected to a suction air conduit and suction source. This angle 29a is adapted to be lifted by a corresponding pushrod 30. When so actuated, angle 29a sucks off or withdraws the wrapping from the mandrel 6b in downward direction. The lower end of the withdrawing angle 29a carries a pinion 31 (FIG. 6) which in its lowermost position meshes with a horizontal rack 32. When rack 32 is horizontally displaced, pinion 31 meshes therewith and consequently also angle 29a is turned by 90° so that the wrapping 4a will occupy the position shown in FIG. 1. A two-part tilting plate 33 now becomes effective. This plate 33 is likewise adapted to be operatively connected to the same suction conduit as angle 29a and now turns about pivot 34 by an angle of 90° so that wrapping 4a is placed on path 1 and held by the abutment 5.

Referring now to FIG. 3, it will be noted that whereas with the embodiment of FIG. 1 the deviating rollers 8 and 9 have their axes located in a common vertical plane, according to the arrangement of FIG. 3, the deviating rollers 8 and 9 occupy a position in which the common plane passing therethrough is a horizontal plane which is parallel to the sliding path 1. In the first instance the device requires more space as to height, whereas in the second instance it requires more space as to length.

In FIG. 3 the various elements shown therein and their functions correspond to those of FIGS. 1 and 2 and, therefore the same reference numerals have been applied to corresponding parts. In the folding station for effecting the longitudinal fold, which comprises the longitudinal folder 16, there is provided a control abutment 38 which likewise acts upon carriage 24 of the holder 21 in order to press the same away from mandrel 6 to thereby permit the folder 16 to become effective.

It is, of course, to be understood that the present invention is, by no means, limited to the particular embodi-

ments shown in the drawings but also comprises any modifications within the scope of the appended claims.

Thus, if desired, a plurality of stepwise advancing mandrel chains 7 may be arranged one alongside the other above a corresponding number of conveying devices 1, 2. In such an instance it is possible for a single operator to serve a plurality of conveying paths. Such an arrangement has been shown diagrammatically in FIG. 2.

As will be evident from the above, the wrapping forming apparatus according to the invention does practically require not more space than the transporting device for the material to be conveyed inasmuch as with such an arrangement of the folding mandrels also the withdrawing and feeding means for the paper cuts are located vertically over the feeding paths of the material to be wrapped. In this way the machine becomes much more accessible and smaller and can easily be observed so that more machines can be mounted over a certain floor surface. Moreover, an arrangement according to the present invention makes it possible to provide the machines with a plurality of paths because all units are accessible to the operator from one side of the machine.

What I claim is:

1. A device for preparing wrappings with a bottom fold, especially for cigarettes, which includes; a plurality of mandrels adapted to receive wrapping blanks and to have them folded therearound, conveying means supporting said mandrels so that one end of each mandrel extends outwardly from the conveying means, said mandrels being in spaced relationship to each other arranged on said conveying means, guiding means supporting said conveying means and guiding the same over a closed path having two substantially parallel sections and two curved sections respectively located at the ends of said substantially parallel sections and forming a continuation thereof, said guiding means being so arranged as to guide said conveying means and said mandrels along a substantially vertical plane, first means arranged adjacent one of said parallel sections for supplying blanks to said mandrels and for folding the blanks about said mandrels including folding of each blank to form a closed end on the wrapping at the outer end of the respective mandrel, second means arranged adjacent the other parallel section in the form of a heating and pressure strip adapted for resilient engagement with a plurality of said closed ends of the wrappings to seal said closed ends, and third means in said vertical plane beneath said guiding means operable for engaging the wrappings on said mandrels after they leave said second means and while the mandrels extend downwardly and for withdrawing the wrappings from said mandrels, said third means being operable for rotating each wrapping about a vertical axis following the withdrawing thereof from the respective mandrel.

2. A device according to claim 1 in which said third means includes tilting means for tilting the withdrawn and rotated wrappings.

3. A device according to claim 2 which includes further conveyor means beneath said tilting means forming delivery path means and adapted to receive the wrappings from said tilting means.

4. A device according to claim 3 in which each mandrel has two broader parallel sides and two narrower parallel sides connecting the broader sides and said broader sides are substantially parallel to said vertical plane.

5. A device according to claim 4 in which said straight sections extend substantially vertically and said conveying means is in the form of a chain entrained over substantially vertically spaced roller means.

6. A device according to claim 4 in which said straight sections extend substantially horizontally and said conveying means is in the form of a chain entrained over substantially horizontally spaced roller means.

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7. A device according to claim 4 in which the means for supplying blanks to said mandrels and for folding said blanks about said mandrels causes two edges of the blank to overlap on one of the narrower sides of said mandrel, clamp means adjacent each mandrel for clamping said overlapped edges to said narrower side of said mandrel, means for lifting the clamp from each mandrel to receive said overlapped edges, and means for lifting the clamp from each mandrel when the wrapping is withdrawn from the mandrel by said third means.

8. A device according to claim 4 in which said guiding means includes spaced channels opening toward each other and each mandrel includes a pair of rollers on the inner end extending into and supported by each said channel, and said conveying means comprises a chain between said channels and connected to about the middle part of the inner end of each mandrel.

9. A device according to claim 4 in which each mandrel comprises two sections moveable toward each other to release a wrapping thereon to facilitate removal therefrom by said third means, and means for moving one of said two sections toward the other thereof during operation of said third means.

10. A device according to claim 1 in which said conveying means includes a plurality of conveyors in side by side relation, guiding means pertaining to each conveyor, a respective said second and third means for each conveyor, and a respective further conveyor means for each of said plurality of conveyors.

11. A device for preparing wrappings with a bottom fold, especially for cigarettes, which includes: a plurality of mandrels adapted to receive wrapping blanks and to have them folded therearound, conveying means supporting said mandrels, said mandrels being in spaced relationship to each other arranged on said conveying means, guiding means supporting said conveying means and guiding the same over a closed path having two substantially parallel sections and two curved sections respectively located at the ends of said substantially parallel sections and forming a continuation thereof, said guiding means being so arranged as to guide said conveying means and said mandrels along a substantially vertical plane, and means arranged below said guiding means and operable to withdraw a completed wrapping from the respective lowermost mandrel along said substantially vertical plane and turning the thus withdrawn wrapping by substantially 90° about a vertical axis.

12. An arrangement according to claim 11, which includes a conveyor path arranged below said means for withdrawing a completed wrapping and adapted to receive the same from said last mentioned means, and in which the means for turning the withdrawn wrapping by substantially 90° has associated therewith tilting means for tilting the wrapping from a substantially vertical position onto said conveying path.

13. An arrangement according to claim 12, in which

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the means for withdrawing the completed wrapping and said tilting means are designed as suction responsive means.

14. A device for preparing wrappings with a bottom fold, especially for cigarettes, which includes: a plurality of mandrels adapted to receive wrapping blanks and to have them folded therearound, conveying means supporting said mandrels, said mandrels being in spaced relationship to each other arranged on said conveying means, guiding means supporting said conveying means and guiding the same over a closed path having two substantially parallel sections and two curved sections respectively located at the ends of said substantially parallel sections and forming a continuation thereof, said guiding means being so arranged as to guide said conveying means and said mandrels along a substantially vertical plane, means arranged below said guiding means and operable to withdraw a completed wrapping from the respective lowermost mandrel along said substantially vertical plane, and rack and pinion means operatively connected to said last mentioned means for turning the thus withdrawn wrapping by substantially 90° about a vertical axis.

15. A device for preparing wrappings with a bottom fold, especially for cigarettes, which includes: a plurality of mandrels adapted to receive wrapping blanks and to have them folded therearound, each of said mandrels comprising two sections normally spaced from each other, said sections being movable relative toward each other for reducing the overall size of said mandrels, conveying means supporting said mandrels, said mandrels being in spaced relationship to each other arranged on said conveying means, guiding means supporting said conveying means and guiding the same over a closed path having two substantially parallel sections and two curved sections respectively located at the ends of said substantially parallel sections and forming a continuation thereof, said guiding means being so arranged as to guide said conveying means and said mandrels along a substantially vertical plane, and withdrawing means arranged below said guiding means and operable to withdraw a completed wrapping from the respective lowermost mandrel along said substantially vertical plane, said withdrawing means including means for effecting a relative movement toward each other of said normally spaced two sections of the respective adjacent mandrel to thereby facilitate the withdrawal of the wrapping therefrom.

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