Jan. 10, 1928. 1,655,688

H. CARLE

CONVEYING DEVICE

Original Filed Jan. 8, 1921

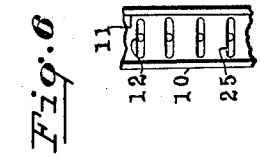


Fig. 6

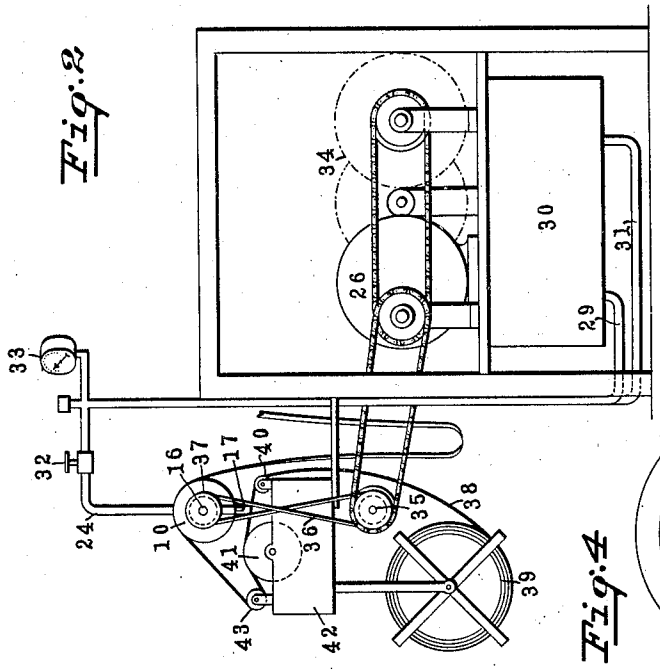


Fig. 2

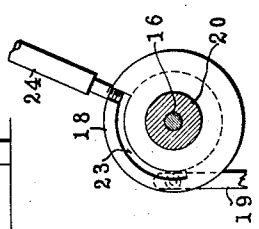


Fig. 5

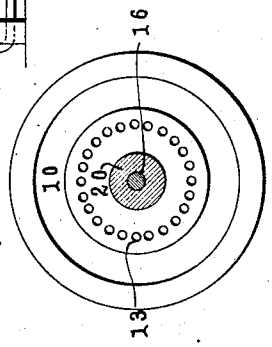


Fig. 4

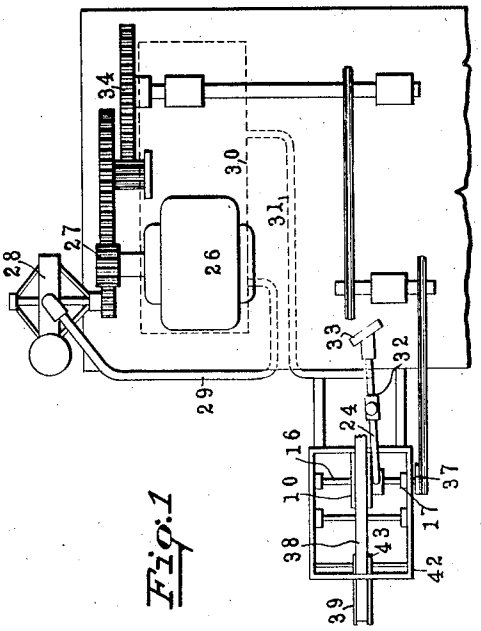


Fig. 1

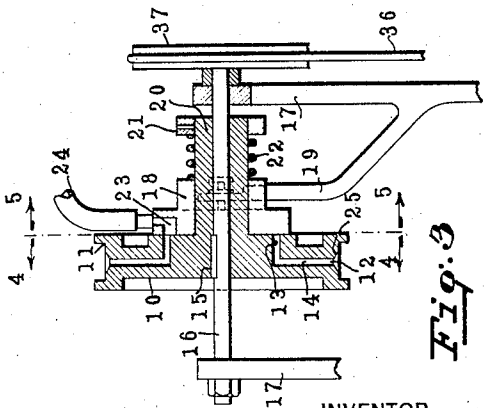


Fig. 3

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UNITED STATES PATENT OFFICE.

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CONVEYING DEVICE.

Original application filed January 8, 1921, Serial No. 435,827. Divided and this application filed October 16, 1923, Serial No. 668,963. Renewed June 7, 1927.

This invention relates to a conveying member, the present application being a division of my prior application "Machine for making boxes," Serial No. 435,827, filed January 8, 1921, patented January 22, 1924, No. 1,481,347.

It is an object of the invention to provide a conveying member which may be utilized in connection with any desirable association of mechanism, such as, for example, that illustrated in the application previously referred to, and which is particularly adapted for use in connection with the conveying or feeding of strips of material such as, for example, paper.

It is a further object of the invention to provide a conveying device which may be operated at any desirable speed and by means of which the material being fed will be efficiently retained in engagement therewith.

A still further object is to be predicated to the provision of an article of the nature stated, which, although efficiently engaging the material being fed under all conditions, will not in any wise injure the said material.

Another object to be predicated to this invention is that of furnishing a conveying device which is particularly adapted for use in the conveying or feeding of a strip or web of moist material such as would be the case if a coating of adhesive were applied to one of the faces of the material.

Still another object is that of constructing a conveying device which is preferably to be utilized for the purpose of feeding a strip of material and which, in such use, will serve to positively move the fed strip.

An additional object is that of providing a conveying device which will efficiently perform the purposes for which it is intended and which will also be economical and readily manufactured.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction combination of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a fragmentary plan view of a conveying device constructed in accordance with the present invention, and showing the same connected with one form of apparatus which may be utilized for operating the same,

Fig. 2 is a side elevation of the device constructed in Fig. 1,

Fig. 3 is an enlarged transverse sectional view of the conveying device,

Figs. 4 and 5 are sectional side views taken along the line and in the direction of the arrows indicated at 4—4 and 5—5 respectively, in Fig. 3, and

Fig. 6 represents a detail of the periphery of the said conveying device.

In the present embodiment one of the preferred forms of the invention has been shown, and this includes a conveying device in the nature of a feeding wheel which is formed with ports selectively connectible with an air exhaust so that a strip which is in contact with the wheel adjacent these ports will be retained in this engagement.

Thus, reference being had particularly to Figs. 3, 4, 5 and 6, inclusive, it will be noted that the reference numeral 10 indicates a feeding wheel which, in the present embodiment, is particularly adapted for use in connection with the conveying of strips and this wheel preferably has its periphery recessed, as at 11, to form what might be termed a track for the accommodation of the strip to be fed. Also it will be observed that a series of circumferentially related openings 12, are formed in the base portion of the track and these openings each communicate with one of an annular series of ports 13 in the present instance formed in the side face or hub of the wheel 10. This communication may be established by means of a number of independent conduits 14 each having one of their ends in communication with one of the openings 12, the opposite end of each of the conduits being connected with one of the ports 13.

The wheel 10 may be keyed, as at 15, to a shaft 16 and the latter is mounted for rotation in a suitable bracket 17. A plate 18 is disposed adjacent to that face of the wheel or hub in which the ports 13 are formed, and this plate in the present exemplification

is rotatable relative to the shaft 16 and wheel 10, and is held against rotation with respect to the fixed parts of the mechanism by means of an arm 19 forming a part of the bracket 17, any desirable form of connection being utilized at this point. In order to hold the plate 18 in intimate engagement with the face of the wheel last mentioned, it is preferred that an extension 20 be provided, forming a part of the wheel, and in the nature of a sleeve encircling the shaft 16. Mounted upon this extension and adjacent the end of the same is a retaining collar 21 and interposed between this collar and the outer face of the plate 18 is a spring 22.

With a view to connecting the openings 12 with a suitable air exhaust, it will be perceived that the plate 18 is formed in its inner face with a groove providing an air chamber 23, which is disposed in an arc having a radius equal to that of the circle in which the series of ports 13 are disposed, and when the parts are in assembled position as, for example in Fig. 3, the chamber 23 communicates with certain of these ports. One end of this chamber is connected as, for example by a conduit 24, with a suitable air exhaust and thus it is obvious that those openings 12 which communicate with ports in registry with the chamber 23 will have fluid drawn through them and in the event that any article, such as a strip, overlies the openings 12, this article will be gripped and maintained in intimate contact with the periphery of the wheel 10, attention being invited in this connection to Fig. 6, in which it will be noted that the openings 12 are preferably flared adjacent their outer edges, as at 25, so as to engage the strip throughout approximately its entire width. If now the plate 18 and the wheel 10 are moved relative to each other, it will be understood that certain of the ports will move out of registry with the air chamber 23, while others of the same will pass into operative connection therewith, and due to the fact in the present instance, that the plate 18 is held stationary, it will be noted that the openings 12 will thus exert a pneumatic gripping action in a predetermined station in the path of rotation of the wheel. In consequence, if a strip or other piece of material is fed over the wheel or by the same, this strip will be firmly gripped throughout a certain part of the path of travel of the wheel and will be released upon arriving at a predetermined station.

Now with a view to providing an air exhausting means, as well as means serving to move the wheel 10 relative to the plate 18, it will be perceived, reference being had to Figs. 1 and 2, that the same may be placed in any desirable association of mechanism. Thus, in these views the reference numeral 26 indicates a motor which by means of a suitable drive 27, serves to operate a vacuum pump 28, the latter being connected by a conduit 29 with a reservoir 30, which is in turn connected by a further conduit 31 with a conduit 24, and it will, of course, be understood that a suitable valve 32 and gauge 33 be associated with this mechanism, in order to regulate the flow of the fluid, and to indicate the degree of vacuum existing in the reservoir 30 and associated conduits. The motor 26, by means of a further drive 34, may also serve to rotate a countershaft 35 which is connected in the present instance, by a belt 36 with a pulley 37, attached to the shaft 16.

If, for example, it is desired to feed a strip 38 to a mechanism where the same is to be operated on, and this strip is to have one of its faces coated with adhesive, this may readily be accomplished by the use of a conveying apparatus or device involving the type of mechanism forming a part of the present invention. Thus, the strip 38 may move from a supply reel 39, over an idler 40 and thence over an adhesive applying roller 41 which extends within and beyond an adhesive containing tank 42, and contacts with one of the faces of the strip 38. Thence the strip may pass over a second idler 43 with its coated face outermost, and be engaged by the wheel 10 and fed thereby to the mechanism for receiving the coated strip.

From the foregoing it will be perceived, although the strip is moist and thus very susceptible to injury, that in using a conveying or feeding device within the scope of the present invention, it is very unlikely that the strip will be torn or otherwise mutilated despite the fact that by the use of the present invention, the material is steadily and positively fed at virtually any rate of speed which may be desired. Also, it will be understood that the device will not become objectionably coated with adhesive or other moisture, (due to the fact that the moist face of the strip preferably extends outwardly), this being a decided advantage over most mechanisms heretofore utilized for feeding material of this nature, which mechanisms usually became coated with adhesive or other moisture after the machine had been in operation for a short length of time.

Thus it is obvious in operation, that among others the objects aforementioned are accomplished and it will be understood that the construction of the conveying device, i. e., the feed wheel and associated mechanism, may be modified in many particulars according to the type of apparatus in connection with which it is to be utilized.

Since certain changes may be made in the above construction and different embodiments of the invention could be made with-

out departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an apparatus of the character described, in combination, a wheel having a recessed periphery adapted to provide a track and guide for a strip to be operated on by said wheel, said wheel having independent conduits opening into its periphery at a plurality of points circumferentially of the wheel said conduits also terminating in a circumferential series of ports in the side of the wheel, said wheel having a laterally extending hub, a plate mounted on said hub so as to permit rotation of said wheel relative thereto, a spring encircling said hub, means adapted so to tension said spring as to cause it to press said plate closely against that side of said wheel having said ports, said plate having a chambered portion into and out of registry with which said ports successively pass as said wheel rotates, an air exhaust apparatus operatively connected to draw from said chamber, and means adapted to rotate said wheel.

2. In an apparatus of the character described, in combination, a wheel having a recessed periphery adapted to provide a track and guide for a strip to be operated on by said wheel, said wheel having independent conduits opening into its periphery at a plurality of points circumferentially of the wheel said conduits also terminating in a circumferential series of ports in the side of the wheel, said wheel having a laterally extending hub, a plate mounted on said hub so as to permit rotation of said wheel relative thereto, a spring encircling said hub, means adapted so to tension said spring as to cause it to press said plate closely against that side of said wheel having said ports, said plate having a chambered portion into and out of registry with which said ports successively pass as said wheel rotates, an air exhaust apparatus operatively connected to draw from said chamber, means adapted to rotate said wheel, a shaft supporting and rotatable with said wheel, a bracket on which said shaft is journaled, and means connected to said bracket adapted to cooperate to limit rotative movement of said plate in one direction.

3. In an apparatus of the character described, in combination, a strip supply reel, an adhesive applying roller, means adapted to guide the strip from the reel into adhesive receiving contact with said roller, a wheel having in its periphery a series of circumferentially related pneumatic gripper openings, said strip being looped over said wheel so that the face of the strip opposite to that receiving adhesive from said roller is in contact with said periphery, means adapted to rotate said wheel, and air exhaust, and means adapted to establish communication between said air exhaust and pneumatic gripper openings at a predetermined station in the path of rotation of said wheel so as to cause said opposite face of said strip to be continuously gripped to said wheel, and the strip fed past said roller and delivered from said wheel.

In testimony whereof I affix my signature.

HAROLD CARLE.