Dec. 6, 1932. F. G. WIKSTROM 1,890,071

PAPER WORKING MACHINE

Filed Nov. 17, 1931

Fig. 1.

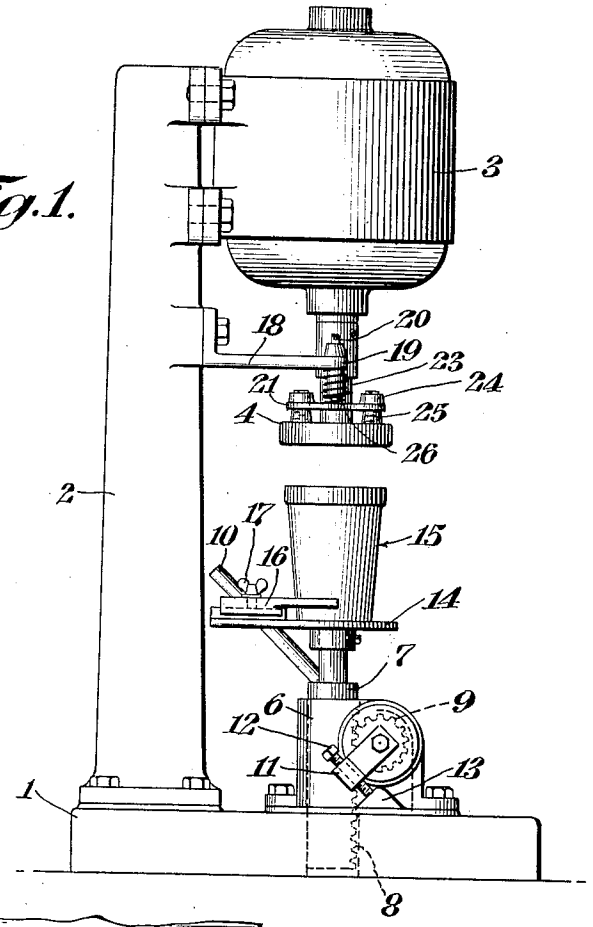


Fig. 2.

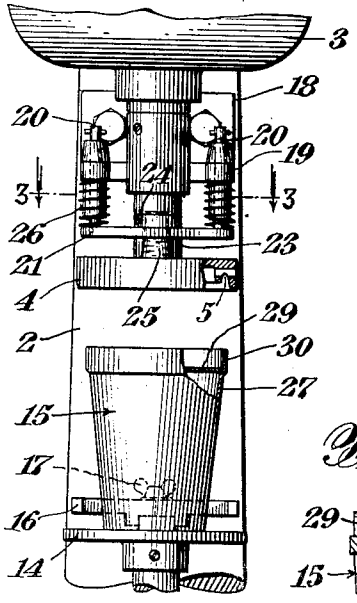


Fig. 3.

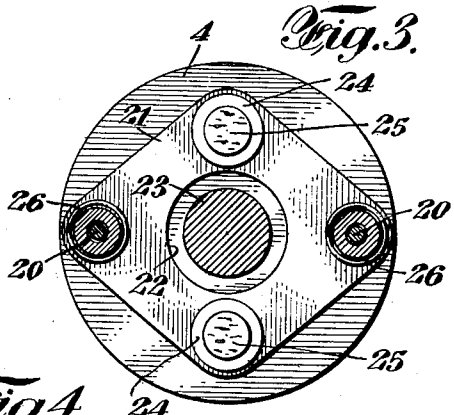
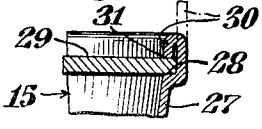


Fig. 4.



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UNITED STATES PATENT OFFICE

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PAPER WORKING MACHINE

Application filed November 17, 1931. Serial No. 575,557.

This invention relates to paper working machines. The invention has been found to be particularly useful in connection with that class of such machines utilized for operation upon paper containers made of sheet paper, cardboard or the like fibrous material for turning, crimping or folding over an edge of said material, such for example as in operating upon the side wall or body portion of paper receptacles.

In operating upon paper, cardboard or fibrous material, especially where such material contains certain forms of sizing or is wax-impregnated, it has been found desirable to use heated dies which may either be in the form of crimping heads or spinning or sealing dies, etc. In such cases heat has been found to be efficacious in assisting the mechanical forming or molding of the paper or fibrous material in the first instance, and in distorting or setting the stock so formed in such manner that it will remain in the form and condition resulting from the die or spinning head operation. Heretofore such heat has been applied to elements of this kind by means of an electrical heating element which furnishes heat to the die or spinning head by electrical resistance. Such practice has necessitated a certain undesirable time element within which to heat the die or spinning head to the desired temperature, and furthermore necessitates the use of an appreciable amount of electrical energy with the attendant expense and undesirable upkeep of the heating unit.

An object of this invention is to provide heat, to the element which it is desired to heat, by means of a simple, efficient and dependable device which is economical in operation and upkeep.

The invention consists in the novel features, arrangements and combination of parts embodied by way of example in the apparatus hereinafter described as illustrating the present preferred form of the invention, and the invention will be more particularly pointed out in the appended claims.

Further and more specific objects, features and advantages will more clearly appear from the detailed description given below taken in connection with the accompanying drawing which forms a part of this specification, and in which

Fig. 1 is a side elevation of a simple device for operating upon paper containers to form a lip or edge on the body of the same, and serves to illustrate the invention,

Fig. 2 is an enlarged front elevation of a portion of the device of Fig. 1 comprising the crimping head or spinning die shown in cooperative relationship with the heating element therefor,

Fig. 3 is a transverse cross section taken at the line 3—3 of Fig. 2, and

Fig. 4 is a segmental cross section illustrating the paper container after it has been operated upon in the device illustrated in Fig. 1.

In the present preferred form of the invention as illustrated in the drawing the apparatus disclosed is adapted to operate upon paper containers on which the cover has been placed and where it is desired to crimp, fold or turn over the upper edge or lip of the side walls of the container so as to engage the cover and lock the same in sealed position; it being understood that in such cases the contents has been placed in the receptacle in which it is desired to be sealed. As is customary in such machines, the spinning or curling die is rotated at a suitable speed while the receptacle is held in a non-rotating position and is moved upwardly against the die or spinning head, although it is quite obvious that the die may be held stationary and the receptacle rotated with the same result.

Referring more particularly to Fig. 1: the frame of the machine comprises a base 1 and pedestal 2 supporting suitable means for rotating the die, such for example as the electrical motor 3. The sealing die 4 is attached to the armature shaft of the motor and is adapted to be rotated thereby. This sealing die may be of any suitable form to crimp or curl over the upper edge or lip of the paper container, in a manner well understood to those skilled in the art; the die being provided with a suitably formed curling groove 5 designed and positioned to perform the desired function. Since the particular config-

uration or formation of the curling or sealing die 4 per se forms no part of the present invention, it is not deemed necessary to describe the structure of the sealing die with greater particularity.

Attached to the base 1 is a vertical bearing 6 in which is slidably mounted a plunger 7 provided with a gear rack 8 in cooperative engagement with a pinion 9 which is connected to a lever or handle 10. A stop 11 is rigidly attached to the gear 9 and is provided with a stud 12 adapted to be adjusted for engagement with a suitable stop 13. A support or table 14 is suitably secured to the upper end of the plunger 7 for carrying the paper container 15. A suitable stop 16 is provided for centering the container 15 in proper alignment with the die head 4 and the stop 16 is adjustable by means of a slide and wing nut 17 to provide for different sizes of containers to be operated upon.

It will therefore be seen that upon movement of the handle 10 in an outward direction from the position shown, the gear 9 will be rotated in a clockwise direction raising with it the plunger 7 and receptacle 15 so that the upper edge thereof will engage the groove 5 of the sealing die 4.

The heating element and its cooperative relationship to the sealing die 4 will now be described with reference to Figs. 1, 2 and 3. A bracket or arm 18 is rigidly attached to the frame 2 and is provided with bifurcated ends such as 19 in which is slidably positioned vertical pins 20 whose lower ends are attached to a plate 21 provided with a central opening 22 through which the motor armature shaft 23 passes freely. The plate 21 is provided with bosses 24 in which are positioned cork plugs 25, which in the present embodiment are illustrated as cork bottle stoppers such as have been found excellent for the purposes desired. The lower faces of the plugs 25 engage the upper surface of the die 4 and are resiliently held thereagainst by means of the compression springs 26 which surround the lower end of bosses formed on the bifurcations 19, the springs thereby being held in position between the stationary member 18 and the plate 21 which is supported in the manner above described to thereby permit a vertical movement but being held against a rotatable movement. The springs 26 are of such a character as to hold the corks 25 in positive frictional engagement with the upper face of the die 4 to such an extent that upon rotation of the die 4 the friction between the corks and the upper surface of the die will generate the degree of heat at which it is desired to operate the die. It will be well understood by those skilled in the art that the size of the friction elements such as the corks 25, the character of the resilient means such as the springs 26, and the amount of metal in the die 4, either individually or collectively, may be varied to produce the desired temperature for the speed at which the die is operated.

In the apparatus herein described to illustrate the invention the paper container 15 is formed with a body side wall of approximately $\frac{1}{32}''$ in thickness and comprised of a plurality of layers of paper stock; the entire body of the receptacle may be coated with wax or paraffin of a character well understood by those skilled in the art. The heat generated is sufficient in the apparatus presently described to melt this wax and assist the curling over of the edge of the paper by the spinning die. Likewise, in such coated containers sufficient wax is melted from the paper stock to insure a hermetic seal between the cover of the container and the inwardly and downwardly curled edge engaging the same. In order to more clearly understand the character of the operation above described, reference is made to Figs. 2 and 4 in which the body or side wall 27 of the container 15 is provided with a seat 28 in which the cover 29 is positioned. With the machine operating to rotate the sealing die 4, the handle 10 is pulled outwardly so that the upper edge or lip 30 of the container engages the sealing groove 5 and this deforms or curls over the lip 30 in the position shown in Fig. 4, at which time the lower edge of the lip engages the upper surface of the cover 29 as at 31; the wax which has been melted by the heat of the die serving to form a seal at this point.

Having thus described my invention with particularity with reference to its preferred form, it will be obvious to those skilled in the art, after understanding my invention, that other changes and modifications may be made therein without departing from the spirit and scope of my invention, and I aim in the appended claims to cover such changes and modifications as are within the scope of the invention.

What I claim is:

1. In a paper working machine the combination of, a crimping head and friction means for heating said head, said head and said friction means being relatively movable one with respect to the other.

2. In a paper working machine the combination of, a crimping head and friction means resiliently held in engagement therewith for heating said head, said head and said friction means being relatively movable one with respect to the other.

3. In a paper working machine the combination of, a crimping head, supporting means for an article of paper to be operated upon, said head and support being relatively rotatable one with respect to the other, and friction means for heating said head, said head and said friction means being relatively movable one with respect to the other.

4. In a paper working machine the combi-

nation of, a member to be heated, a second member, said members being relatively movable one with respect to the other, and friction means carried by one of said members and bearing on a surface of the other of said members for heating said first member.

5. In a machine for turning over the edge of a paper receptacle the combination of, a support for said receptacle, a rotatable spinning die, and friction means resiliently held against a surface of said die and having relative rotary motion with respect to said surface for heating said die.

In testimony whereof I have signed my name to this specification.

FRANK G. WIKSTROM.