This invention relates to the apparatus and procedure which contribute to the manual operation of enclosing individual articles, such as bottles, in wrapping material. The apparatus includes a support surface provided with means for holding a sheet of wrapping material flat and in place on that surface so as to receive an application of adhesive material. The adhesive is spread on and throughout the extent of the exposed surface of the sheet located on the support surface. The adhesive spreading apparatus includes pivotally supported means which, as illustrated herein, includes a roller. The roller is manually operated during the operation of spreading adhesive on each separate sheet of wrapping material placed on the support surface. The operation of the roller is followed by a scraper, herein termed a knife. The wrapping material employed by us in wrapping bottles, is aluminum foil in sheet form, and we have found it advantageous to employ molen wax as the adhesive when the article to be wrapped is formed of glass, that is, an article such as a glass bottle, and the wrapping material is a metallic foil such as aluminum foil.

In the apparatus illustrated, a vacuum is employed to hold each individual sheet of wrapping material in position on the support surface preparatory to applying a coating of adhesive material. The vacuum is separately applied to each such sheet and, for that purpose, is periodically applied to a vacuum chamber which is included as a part of the apparatus and is located beneath the support surface. The vacuum is applied to each sheet through two lines of closely spaced apertures extending through a support plate which is the cover plate of the vacuum chamber. Each separate sheet of wrapping material is so located on the cover plate that the vacuum-applying apertures are located along two opposed edges of the sheet. In addition, the vacuum application is such that each sheet of foil is preferably held firmly in place on the support surface throughout the adhesive-spreading operation.

Shortly after this operation is completed in connection with each separate sheet of foil, the adhesive-spreading roller is moved back into an adhesive-containing receptacle and the application of vacuum is automatically stopped. In the illustrated apparatus, this is accomplished by the movement of the roller into the receptacle. Shifting off the vacuum releases the sheet of wrapping material from the holding force applied to it through the support surface, and the operation of wrapping a sheet of wrapping material around a bottle is preferably immediately started without fully removing the sheet from contact with the support surface.

As soon as each wrapping operation is completed in connection with one bottle and the wrapped bottle is fully removed from the support surface, another piece of wrapping material may be placed on the support surface in position to receive an application of adhesive, and vacuum is again applied to the vacuum chamber so as to hold the new piece firmly in place on the support surface during the adhesive-spreading operation. An object of our invention is to provide simple and effective apparatus and procedure for aiding the operation of enclosing an article such as a bottle, in a decorative wrapping.

This and other objects to be made apparent through the further description of illustrated embodiment of our invention, are attained by means of apparatus illustrated in the accompanying drawings.

In the drawings:
- FIGURE 1 is a plan view of the apparatus embodying our invention and shown in FIGURES 2 and 6;
- FIGURE 2 is a side elevation of the apparatus shown in FIGURE 1;
- FIGURE 3 is an end view of the apparatus as from the line III—III of FIGURE 1;
- FIGURE 4 is a transverse sectional view on the line IV—IV of FIGURE 1;
- FIGURE 5 is a fragmental sectional view on the line V—V of FIGURE 1;
- FIGURE 6 is a sectional view on the line VI—VI of FIGURE 1;
- FIGURE 7 is an isometric view of a vacuum-applying piping system partially shown in FIGURE 4 and air connection passages indicated in FIGURE 1;
- FIGURE 8 is a fragmental view along the line VIII—VIII of FIGURE 1;
- FIGURE 9 is a fragmental view along the line IX—IX of FIGURE 1;
- FIGURE 10 is a fragmental view along the line X—X of both FIGURES 1 and 11;
- FIGURE 11 is a fragmental view along the line XI—XI of FIGURE 10, portions shown in section;
- FIGURE 12 is a partial plan view of the apparatus shown in FIGURE 11;
- FIGURE 13 is a fragmental view along the line XIII—XIII of FIGURE 1;
- FIGURE 14 is a fragmental sectional view showing a bottle positioned adjacent to the support plate as disclosed in FIGURE 6, i.e., positioned at the forward end of that plate and ready to receive wrapping material;
- FIGURE 15 is a similar view showing a bottle on the support plate and partially surrounded by wrapping material;
- FIGURE 16 discloses a fully wrapped bottle located adjacent the rear end of the support plate;
- FIGURE 17 discloses a partially wrapped bottle; and
- FIGURE 18 is a diagrammatic view of a fully wrapped bottle.

The apparatus which now embodies the preferred embodiment of our invention includes a rectangular casing which surrounds an open top heating chamber employed for melting adhesive, a chamber enclosing a piping system, and a vacuum machine. The chamber has an article wrapping platform or flat cover plate which provides a support surface for each of the separate sheets of wrapping material employed in wrapping each of a succession of articles. As shown, the vacuum machine is mounted on a foundation plate located on and secured to longitudinally extending frame members forming a part of the casing structure shown in FIGURES 1, 2, and 6.

The cover plate of the chamber is provided with selectively operable means for holding forward and rearward edge portions of a sheet of wrapping material tightly against the cover plate surface. The wrapper holding means comprises two lines of closely spaced apertures that communicate with open top troughs or channels located within chamber that extend transversely across and are secured to the inner surface of the cover (FIGURES 1, 6, 7, and 8). The spaces between the flanges of each channel is in open communication with a separate branch pipe which, in turn, communicates with and is a part of a system of piping indicated in FIGURE 1 and clearly shown in FIGURES 1, 6, and 7 as including a pipe which communicates at one end with a vacuum control valve.
3,121,647 (URES 1 and 2) and at the other end with a discharge pipe 27 (FIGURES 1, 2, 6, and 7). The four pipes mentioned communicate with each other through a four-way connection 28 shown in FIGURES 6 and 7 and indicated in FIGURE 1. Pipe 27 is a refuse discharge pipe and projects through a vertical wall of the above-mentioned casing, see FIGURES 2 and 7.

The valve 26 communicates with the vacuum machine 20 through piping indicated at both 29 and 30 of FIGURE 1 but nowhere fully shown. Any suitable means may be employed for operating the vacuum machine and it is to be understood that vacuum pressure is periodically maintained in chamber 38 and delivered from there through the apertures 32—33 for the purpose of holding each of a succession of sheets of wrapping material in place on the support plate 19.

The application of vacuum is controlled or timed by the valve 26 which, in turn, is controlled by movements of a roller and knife combination as that combination is moved to and from its position as shown in FIGURE 6. The combination includes a roller 31 and knife 32 both disclosed in FIGURES 1, 2, 5, 6, 10, 11, and 12 of the drawings. As indicated, the combination is manually moved from their positions shown in FIGURES 1 and 2 to, and then from their positions as shown in FIGURE 6. This movement is along, i.e., relative to a valve and roller interconnecting member 33, which controls the opening and closing of the vacuum valve 26 and, as shown in FIGURES 1 and 2, the rod 33 extends through a tube-shaped bearing 34 shown in FIGURES 1 and 2 as secured to one of the frame members 40. The bearing 34 forms a partial support for the rod 33 and through which the rod is slidably movable in the operation of opening and closing the valve 26.

As shown in FIGURES 1 and 2, the valve is provided with an operating handle 35 to which the rod 33 is pivotally secured (see FIGURE 6). A coiled spring 36 is also secured to the handle 35, one end of the spring being secured to the handle and the other end to a frame portion of the casing 37 so as to position the spring with relation to the handle, that it tends to move the handle to open the valve 26 when the rod 33 is released from the position shown in FIGURE 1 by the movement of handle 37 along the rod 33 by a movement of the roller and knife combination which raises the combination out of the chamber 17 and across the support surface 19 of the flat top of the chamber 18 to the position shown in FIGURE 6. As the roller moves out of the chamber 17 it moves upwardly against the surface of the inclined perforated guide way 38 formed by screening. This movement is accomplished manually by moving handle or pull bar 39 from the position shown in FIGURES 1 and 2 to the position shown in FIGURE 6.

As shown in FIGURES 10, 11, and 12, both the roller 31 and the knife 32 are secured to the linkage means or support arms 49 which, as shown in FIGURES 1 and 2, are pivotally secured to the pull bar 39 by being pivotally secured to two spaced angle bars 39' which are rigidly secured to the pull rod 39. As shown in FIGURE 6, the roller 31, on moving out of the chamber 17, moves upwardly and over exposed plate member 41 which edge support means 41-41, each of which is located along one of the lateral edges 19a of the support plate 19 and is raised above that surface approximately 1/8 of an inch, so that the surface of the roller 31 does not prematurely touch the surface 19.

Previously noted, the plate 19 provides a support for each separate sheet of wrapping material which is held in place thereon by vacuum applied thereto through the two lines of apertures 22. With this arrangement, each sheet of wrapping material is yieldedly held in place on the support plate during the operation of spreading adhesive material on and across the entire surface of the sheet and also preliminary to the operation of securing each sheet to a bottle to be wrapped. Each such sheet may be at least partially supported on the support plate during the operation of wrapping it around a bottle B, see FIGURES 14 and 15. End stop 42 aids in positioning the wrapping material on support plate 19 and in also limiting the movement of the roller-knife combination as it passes across the support surface 19 to the position shown in FIGURE 6.

The box 43 is located in the chamber 17 below the guideway 38 and an upwardly open adhesive reservoir 17a that has a bottom wall 17b and a front wall 17c. The coil box 43 includes heating coils 52 for melting the adhesive material when wax is employed as the adhesive. The chamber also includes a thermostatic member in the form of a rod 44 which extends transversely across that dimension and is rotationally adjusted by a thermostat 45 which indicates the temperature of the adhesive within the chamber 17. As shown, the thermostat is located on the upper edge of the casing enclosing the chamber 17. A switch box 46 is shown in the drawings as located adjacent to the thermostat and encloses the electric switches which control the operation of the vacuum machine 20 and surface heating lamps 47 located in chamber 18. The seal box 43 is also provided with a window 48 for viewing the lamps to determine whether or not they are lighted. Heat from the lamps 47 prevents wax stopped on the surface 19 from hardening and forms a partially melted film for securing the sheets together. In FIGURES 1, 2, 3, and 4 we have disclosed an adjustable hinged shelf or article support extension member 49 which is desirable to secure to the end casing of the chamber 18 by a piano hinge 50 since otherwise the seal tends to distort. The seal is conveniently located as a temporary support for bottles before, during and immediately after they are enclosed in wrapping material. As part of the bottle wrapping operation is to be done by hand, the shelf 49 is provided with an upwardly extending bottle position frame or angle portion 49a which is disposed to a position with respect to a wrapper positioned on the surface 19.

The pull bar 39 is secured at each end to one of a pair of slide bars 51 which extend through longitudinally extending support passages formed in the frame members 21 (FIGURES 1 and 2). The slide bars support the pull handle 39 and, consequently, enable the roller and knife combination from the position shown in both FIGURES 1 and 2, through a rectilinear path, to the position shown in FIGURE 6.

As shown in FIGURE 6, the coil box 43 is open at the open end and the facing coil 52 and is usually open to heat the coils with steam. The coil is diagrammatically shown in FIGURES 5 and 6. The wax employed as an adhesive, is preferably cut into relatively small pieces and dropped into the open top of the chamber 17 at a position such that they will fall into the reservoir 17a just above the coil box 43. In the apparatus illustrated the way 38 along which the roller 31 passes in its movement into and out of the chamber 17 is formed of screening so as not to prevent the formation of heat currents in the mass of hot liquid adhesive in chamber 17 and to prevent a wave of adhesive from being pulled out of the reservoir 17a ahead of the roller 31. A horizontal portion 38a of the perforated guide wave 38 further assists in the dissipation in any wave of adhesive that might be formed in front of the roller 31.

In FIGURE 7 we have shown a partially wrapped bottle B and FIGURE 18 discloses a fully wrapped bottle C where the wrapping material 56 is a foil such as aluminum foil.

As shown in the drawings (FIGURES 2, 6, 10, 11, and 12), the knife 32 is directly associated with the roller 31 and, like the roller, is movable into and out of the liquid adhesive contained in the chamber 17. The knife is employed in spreading adhesive material from the cylindrical surface of the roller as the roller, while rotating, moves out of the chamber 17 and also to a position rela-
tively to the upper surface of the plate 19, as shown in
FIGURE 6. The knife 32, in moving out of chamber
17, across the cover plate 19 and back into the cham-
er 17, carries with it at least some of the excess material
removed by it from the roller and also from the surface
of such sheet of wrapping material as is located on the
plate 19.
As indicated in FIGURES 10 and 11, the knife is se-
cured at each end to a separate annular piece 53, each
of which is loosely mounted on one of the separate spindle 54. As shown in FIGURES 10 and 11, each spindle 54 is secured to a separate knife support 32r (FIGURES 11 and 12).
Each piece 53 is loosely mounted on its supporting spin-
dle so that the knife 32 is held by its own weight against
the positioner washer 55 which surrounds the spindle 54
and is located between the piece 53 and the spindle sup-
port. It is, of course, apparent that the washer 55 may
be changed for the purpose of varying the position of
the knife with relation to the cylindrical surface of the
roller and in this way vary the thickness of the film of
adhesive material located on the surface of the roller and
finally deposited on a sheet of wrapping material 56.
While we have illustrated but a single embodiment of
our invention, it will be apparent that various changes
such as additions, omissions, and modifications may be
made in the apparatus illustrated without departing from
the spirit and scope of our invention as defined by the
appended claims.
What we claim is:

1. Semi-automatic equipment for assisting in the op-
eration of placing wrappers about articles comprising:
   (A) an adhesive applying roller,
   (B) means forming a path for said roller, said path
       forming means comprising, in serial alignment:
       (1) an adhesive reservoir that has a bottom wall
           and a front wall,
       (2) a perforated vertically inclined guideway
           spaced from said front wall, rising from said
           bottom wall and terminating in an upper end
           portion, and
       (3) an article wrapping platform having a rear-
           ward edge portion that is positioned adjacent
           said upper end portion of said inclined guide-
           way, said platform having a perimeter that is
generally similar to, but slightly larger than the
wrappers to be applied,
   (C) means for heating said reservoir,
   (D) orifice means formed in said platform adjacent
       forward and rearward edges thereof, a source of
       sub-atmospheric pressure, and valve means for
       selectively connecting said source of sub-atmospheric
       pressure to said orifice means,
   (E) operating means for moving said adhesive apply-
       ing roller along said pathway, said roller operating
       means comprising,
       (1) a handle,
       (2) linkage means operatively connected to said
           handle for pivotal rotative movement with re-
           spect thereto, and rotatably carrying said roller,
           and
       (3) means for guidingly supporting said handle
           for rectilinear movement over said platform
           whereby said roller is movable from a position
           within said reservoir to one end of said passage-
           way, up the perforated inclined guideway and
           across the article wrapping platform.

3. Semi-automatic equipment as defined in claim 2 fur-
ther comprising,
   (F) means operatively interconnecting said valve means
   and said roller operating means, such that said valve
   means is operative to connect said source of sub-
   atmospheric pressure to said orifice means when said
   roller is moved out of said reservoir and is inopera-
   tive when said roller is returned to said reservoir.

4. Semi-automatic equipment as defined in claim 3 fur-
ther comprising,
   (G) means for heating said article wrapping platform
to prevent the formation of hardened adhesive there-
on.

5. Semi-automatic equipment as defined in claim 3
wherein said perforated vertically inclined guideway in-
cludes a horizontal dwell portion.

6. Semi-automatic equipment as defined in claim 3
wherein said path forming means (B) further comprises,
   (4) roller edge support means means positioned adjacent
       the rearward edge portion of said article wrapping
       platform for preventing premature contact be-
       tween said roller and said platform.

7. Semi-automatic equipment as defined in claim 3
further comprising,
   (G) an article support extension member mounted ad-
       jacent the forward edge of said article wrapping plat-
       form and having an article positioning flange extend-
       ing upwardly from one end thereof to guidingly lo-
       cate the article with respect to said article wrapping
       platform.

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