

No. 677,320.

Patented June 25, 1901.

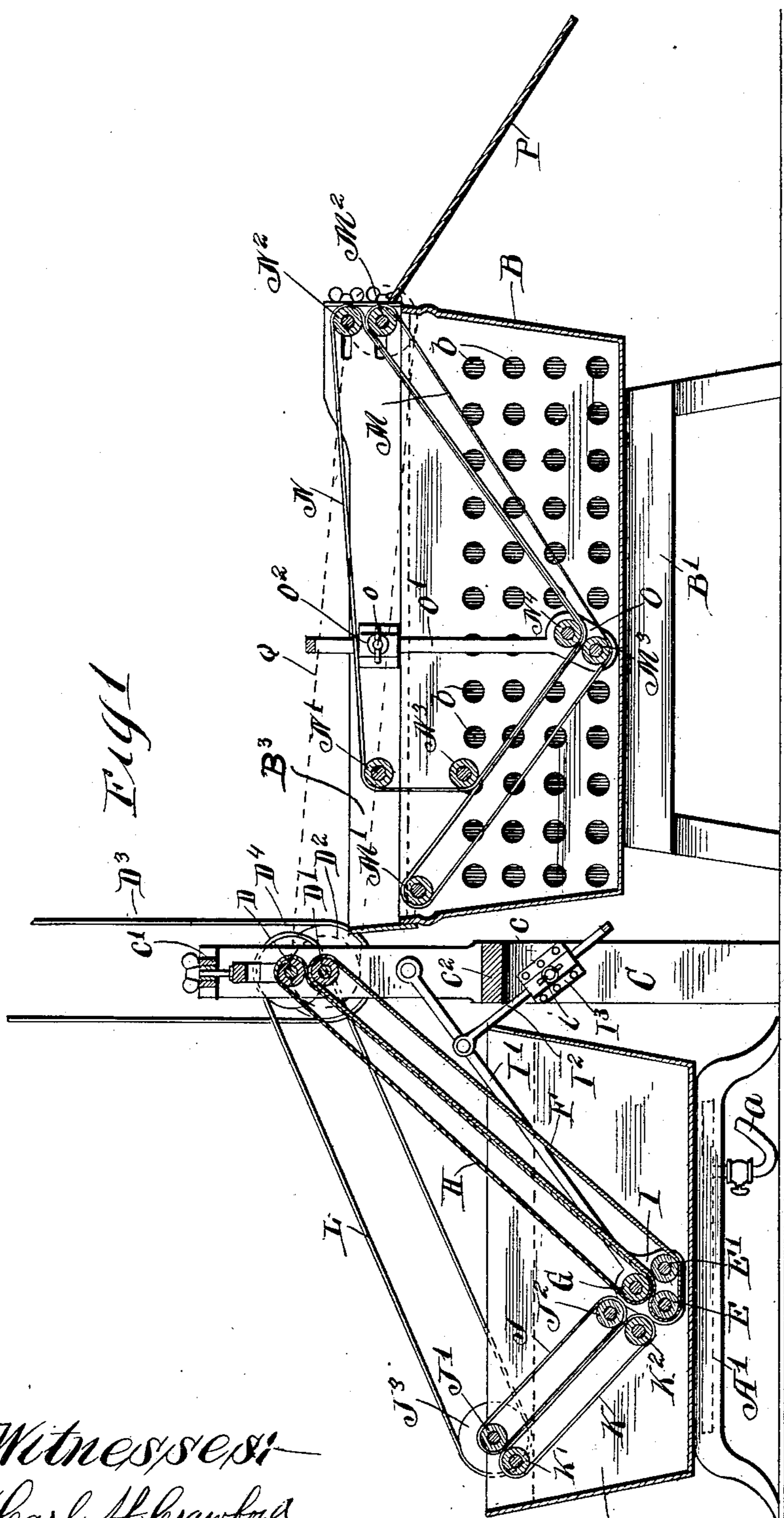
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METHOD OF APPLYING PARAFFIN OR THE LIKE TO PAPER OR OTHER FABRICS.

(No Model.)

(Application filed Mar. 7, 1900.)

2 Sheets—Sheet 1.



Witnesses:—
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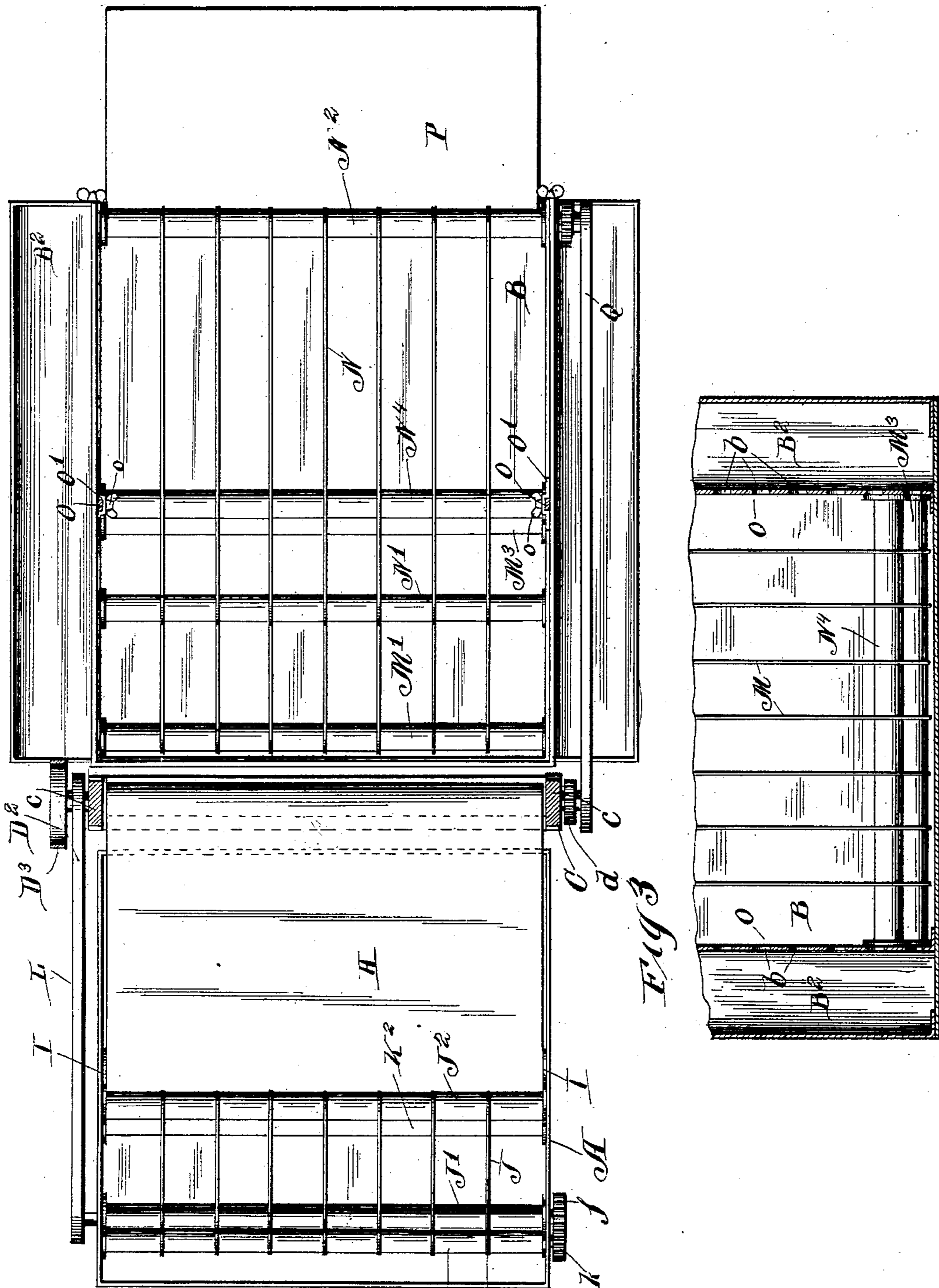
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Witnesses:-
Carl H. Crawford
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Fig. 2
by Poole & Brown

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UNITED STATES PATENT OFFICE.

SHERMAN R. NORRIS AND EMERICH H. VAVRA, OF CHICAGO, ILLINOIS,
ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO E. B. VAN
DEMAN, TRUSTEE, OF JACKSONVILLE, FLORIDA.

METHOD OF APPLYING PARAFFIN OR THE LIKE TO PAPER OR OTHER FABRICS.

SPECIFICATION forming part of Letters Patent No. 677,320, dated June 25, 1901.

Application filed March 7, 1900. Serial No. 7,633. (No specimens.)

To all whom it may concern:

Be it known that we, SHERMAN R. NORRIS and EMERICH H. VAVRA, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Methods of Applying Paraffin or the Like to Paper or other Fabrics; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a novel method of applying paraffin to paper for the purpose of producing a paper impervious to air, moisture, oleaginous matter, and ordinary acids. Such paraffin-coated papers may be used for various purposes to protect different commodities from deteriorating fluids or the like and is also useful for the purpose of confining commodities containing a large percentage of fluid or oleaginous matter—such, for instance, as lard, butter, and the like.

One object of this invention is to provide a process or method for applying paraffin to paper, cardboard, or the like, whereby the paraffin may be applied uniformly to the paper and in such manner as to present a smooth, glossy, and attractive surface after the paraffin has been applied to the paper and hardened and a practically impervious product produced.

A further object of the invention is to apply the paraffin to the paper in such manner as to produce a tough, though elastic, coating or investment, which permits considerable flexure in the paper without breaking such coating.

A paper of this character is especially useful for the purpose of making boxes or packages for butter and lard and like commodities. For table-butter it is highly desirable that the package present an attractive appearance, both because of the fact that it makes a better showing on the shelf of the merchant, and therefore sells more readily than a less attractive package, and also for a like reason, because it is more satisfactory to a discriminating housekeeper. Moreover,

such material by reason of its impervious character acts to retain the flavor of the contained commodity and prevent outside flavors penetrating the same. It is the practice to put up table-butter and lard in individual one-pound or larger packages, and it is desirable that the package be used to contain the contents thereof until all of said contents have been used. Furthermore, the package should be of such nature as to retain the flavor of the contents and prevent outside odors from permeating the commodity, and at the same time should present a clean and attractive appearance. Moreover, it is desirable that such packages not only possess the properties above mentioned, but that they be not discolored or disintegrated by liquids with which they may come in contact. When such individual packages are used for butter, it is desirable in shipping and storing the same that they be submerged in brine or other preservative fluid, and it is very undesirable that the material constituting the packages be of a nature to be discolored or disintegrated by such fluid.

It will of course be understood that the paper coated in accordance with our invention may be used for many different purposes, and the above use has been mentioned as one instance only where such an impervious paper is especially desirable.

In carrying out our invention the paper to be treated is first immersed in a liquid bath of melted paraffin or the like to cause a portion of the material constituting the bath to adhere to the surfaces of the paper, on both sides thereof, it being the intent that the paraffin shall not appreciably penetrate or be absorbed by the paper, but only penetrate the surface fibers sufficiently to secure the proper retention of the coat of paraffin thereon after said coat has been hardened. With many papers, such as Manila paper, wherein the body thereon is made of a different stock from that of the parts constituting the outer surfaces, a considerable absorption of the paraffin by the paper causes discoloration, which is highly objectionable, and in any case such absorption produces a trans-

5 parency, which is for many purposes undesirable. Moreover, a considerable absorption of the paraffin by the paper renders the product permeable, whereby continuous contact
 10 with a liquid, such as brine, acts to disintegrate the product. After the paper has passed through the bath and is removed therefrom it is immediately submerged in a liquid bath having a temperature considerably lower than that of the paraffin-bath. Said liquid bath is in practice composed of pure water and maintained at a low temperature, desirably approximating the freezing temperature of the water. When said sheet
 15 of paper covered with the liquid paraffin is inserted into said chilling-bath, the sudden change of temperature acts to at once chill the coat of paraffin on the fabric, which is as yet in a semiliquid state, and to harden the
 20 same as well as to arrest the absorption of the paraffin by the material. Substantially all the paraffin which adheres to the sheet in passing through the paraffin-bath remains on the outside of the sheet and hardens there-
 25 on, to constitute an impervious external coating having a body sufficiently thick to form a smooth exterior surface notwithstanding slight irregularities on the surface of the sheet before the same has been treated. Such
 30 sudden chilling of the coating of paraffin has the further effect to give to the paper a smooth and glossy appearance, which is very attractive to the eye. Also by reason of the smoothness of finish given to the paper it is
 35 capable of being kept bright and clean and does not tend to retain dirt with which it comes in contact. Furthermore, the smooth surface prevents the contents of the package from sticking to the walls thereof, which aids
 40 not only in keeping the package cleanly, but avoids wastage of the contents of the package. We have found in practice that with the use of ordinary Manila paper the coating when the paper is properly treated takes on a yellowish hue and is therefore highly desirable
 45 for butter or butterine packages. Moreover, such coating forms an investment or skin over the surface of the fabric, which is not only impervious to grease, water, and the ordinary
 50 acids, but permits the fabric to be considerably flexed without breaking the coating. We have found that the best results are secured with respect to the appearance of the fabric treated and the tenacity of the investment or coating when the paraffin-bath is maintained at a temperature between 150° to 175° above zero Fahrenheit and the chilling-bath is maintained between 32° and 40° above zero Fahrenheit. While this particular range
 55 of temperature is not absolutely essential, it is desirable that the differences between the coating-bath and the chilling-bath be maintained substantially at the ratios named.

60 In practically carrying out our invention we provide a receptacle within which the liquid paraffin is contained, a second receptacle closely adjacent to the first, within which the

chilling-bath is contained, and provide carrying means extending from one receptacle to the other for continuously carrying a sheet 70 of paper to be treated through the paraffin-bath, out of the same, and into and through the chilling-bath. The transferring means embraces traveling carriers extending between and into the receptacles and desirably 75 provided with means for operating the same from one point of application of power. Said transferring mechanism will desirably embrace two pressing-rollers between the paraffin and chilling bath and between which 80 the sheet of paper to be treated passes as it leaves the paraffin-bath and before it enters the chilling-bath. Said rollers are provided for the purpose of preventing lumps of the paraffin from clinging to the paper and hard- 85 ening thereon, so as to give a roughened surface to the paper. Said rollers press such clinging lumps of paraffin smoothly upon the paper, but are not placed close enough together to permit the rollers to disturb or dis- 90 place the body of the coating on the paper.

We have shown in the drawings one approved form of apparatus for carrying out our invention.

As shown in the drawings, Figure 1 is a cen- 95 tral vertical section of an apparatus for carrying out our invention. Fig. 2 is a plan view thereof, partly in section. Fig. 3 is a detail plan section of one end of the chilling-bath receptacle. 100

As shown in said drawings, A designates a receptacle for containing the paraffin-bath, and B a receptacle adjacent thereto for containing the chilling-bath. Said receptacle A is supported on a stand A', while the recep- 105 tacle B is supported on a similar stand B', somewhat higher than the stand A'. The stand A' also supports any convenient form of burner for heating the paraffin-bath, as the gas-burner indicated in dotted lines in Fig. 110 1, which is supplied with gas by a pipe a, leading from a convenient source supplying gas. C designates a frame which is located between said receptacles and consisting of vertical posts or standards c c and upper and 115 lower transverse connecting-bars c' c'. At the upper end of said posts c and extending between the same are located two cylindric rollers D D'. Said rollers are provided with gears at one end thereof, (the upper one of 120 which d is shown in Fig. 2,) by which motion from one is communicated to the other. The lower roller is provided at one end thereof outside of the frame with a pulley D², which is adapted to be driven by a belt D³ from an 125 overhead counter-shaft or the like. Near the bottom of the tank is located two rollers E E'. Said rollers are arranged at the same level, and above said rollers E E' and the roller D' is trained an endless apron or belt F, which 130 extends practically across the receptacle A. Above said rollers E E' is located a third roller G, and about said rollers D and G is trained a second endless belt or apron H.

Said rollers D D', E E', and G are so disposed that the adjacent or inner laps of the endless aprons F and H are parallel and run practically in contact with each other from the roller G to the rollers D D'. The said rollers E E' and G are rotatively mounted in heads I I of extender-bars I', the shanks of which are pivoted to the posts or standards of the frame C. Said heads do not touch the bottom of the tank, and the extender-bars are held in position to maintain the aprons stretched by means of arms I², which are pivoted to the extender-bars and have sliding engagement with brackets I³ on the posts c. Set-screws i, passing through said brackets and impinging against the arms, hold the latter in their adjusted positions.

J K designate downwardly-inclined parallel endless tapes which are located in front of the rollers E E' and G and adapted to receive a sheet of material to be treated at the top of the tank and deliver it to the aprons F and H. Said endless tapes J and K are carried by upper and lower parallel rollers J' J² K' K², which latter are mounted in the side walls of the receptacle A. The rollers K' and J' are provided at one end thereof with gear-wheels j k, by which one is driven from the other. The roller J' is driven by means of a belt L, which is trained over a pulley D⁴ on the roller D and a pulley J³ on the roller J'.

The chilling-bath receptacle is provided with two sets of endless tapes M N. The set of tapes M are trained about rollers M' M² M³, the first two of which are located near the top of the receptacle B, one at each end thereof, while the third roller M³ is located near the bottom of the tank near its longitudinal center. Said lower roller is rotatively mounted in heads O of extender-bars O', which bars have sliding engagement with brackets O² on the side walls of the receptacle near the top thereof. Said bars are held in adjusted position by means of set-screws o, passing through said brackets and impinging on said bar. The belt N is trained about rollers N', N², N³, and N⁴. The rollers N' N² are located near the top of the receptacle, one near each end. The roller N⁴ is located near the bottom of the receptacle, near the roller M³, and is mounted in the heads O of the extender-bars before described. The roller N³ is located between the rollers M' M³ and vertically below the roller N'. The roller M² is driven from the roller D' through the medium of an endless belt Q, as shown in Fig. 2. The upper part of the tank B consists of a separable frame B³, attached to the main body of the tank in any suitable manner, and in said separable frame are mounted the rollers M² N' N² and the extender-brackets O². The arrangement of said rollers is such that the sets of tapes M and N travel parallel with each other between the roller N³ and the rollers M² N², so as to positively carry a sheet of fabric from the

roller N³ through the chilling-bath and discharge the same from the tank. It will be noted that the roller N³ is submerged in the chilling-bath, as indicated in Fig. 1, so that the coating given to the paper by its passage through the paraffin-bath is chilled and set on the paper before the sheet passes between the tapes M N. It will be noted, furthermore, that the rollers N' N³ are located over each other and that the part of the belt N between said rollers is vertical. When the sheet of paper being treated is released from the rollers D D' and thrown into the chilling-bath, the advanced edge thereof first strikes the vertical part of the belt N and is carried downwardly into the bath and afterward between the sets of tapes M and N. The rollers M² N² are provided with adjusting devices, whereby the tension of the tapes carried thereby may be regulated. P designates an inclined drop-off board which is located outside of the chilling-bath receptacle B in position to catch the sheet of paper as it is discharged from the tapes M and N.

The coating parts of the carrier described are so constructed and located with respect to each other as to positively carry the sheets through the baths, but do not exert pressure thereon, which would tend to displace or disturb the coating on the sheets.

In order to at all times keep the bath in the tank-receptacle B at a proper temperature, we have provided on each side thereof chambers B² B², located outside of the side walls of said tank and adapted to contain ice or other cooling means—such, for instance, as a refrigerating-coil. The side walls b of the tank, between said refrigerating-chambers and the main body of the tank, are perforated, as shown in Figs. 1 and 3, whereby the water may pass freely from the receptacle to said chambers and be at all times in contact with the cooling means. As before stated, it is desirable that said water should be maintained relatively near its freezing-point, and by this means we are enabled to accomplish this result. In some instances, as where the apparatus is operated in a cold room or during cold weather, such auxiliary cooling devices may not be required; but when the machine is operated in a warm room or during the summer weather such cooling means are highly desirable.

The operation of the apparatus will be apparent from the foregoing description. All of the several rollers are driven from the counter-shaft belt D³. The operator stands in front of the tank A and feeds the sheets of material to be coated between the tapes J and K. Said sheets are carried without interruption through the coating-bath by the tapes J K and aprons F H and delivered by the rollers D D' to the chilling-bath. Said sheets are taken up after passing through the upper surface of the bath between the sets of tapes M N at the point where the rollers N³ engage said belt and is moved between the adjacent laps of said tapes through the chilling-bath

and delivered by the rollers $M^2 N^2$ to the drop-off board.

It will be understood that the coating-bath need not consist of paraffin in its pure state, but may consist of a compound of paraffin with other suitable materials or other materials possessing the peculiar properties of paraffin with respect to the results designed to be effected.

10 We claim as our invention—

1. The method of applying paraffin or the like to paper which consists of two steps, namely, immersing the paper in a bath of paraffin or like material, and immersing said paper in a liquid chilling-bath immediately after it has been removed from the paraffin-bath, the interval between the removal of the paper from the paraffin-bath and its immersion into the chilling-bath being so short that the paraffin will be set before it has been appreciably absorbed by the paper, whereby said paraffin adheres to the paper as a relatively thick, smooth and glossy coating, and the paper being passed through the paraffin-bath without being subjected to pressure against rollers or guiding-surfaces of a nature acting to disturb or displace the coating thereon.

2. The method of applying paraffin or the like to sheets of paper which consists in two steps, namely, immersing the separate sheets in a bath of paraffin or like material, and immersing each sheet in a liquid chilling-bath immediately after it has been removed from the paraffin-bath, the interval between the removal of the paper from the paraffin-bath, and its immersion into the chilling-bath being so short that the paraffin will be set before it has been appreciably absorbed by the paper, whereby said paraffin adheres to the paper as a relatively thick, smooth and glossy coating, and such sheets being passed through the paraffin-bath without being subjected to pressure against rollers or guiding-surfaces of a nature acting to disturb or displace the coating on the sheets.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 5th day of March, A. D. 1900.

SHERMAN R. NORRIS.
EMERICH H. VAVRA.

Witnesses:

WILLIAM L. HALL,
GERTRUDE BRYCE.