Sept. 8, 1953 V. F. HARRINGTON 2,651,119

ART OF TEMPORARILY COVERING ARTICLES

Filed Oct. 30, 1947

Fig. 1

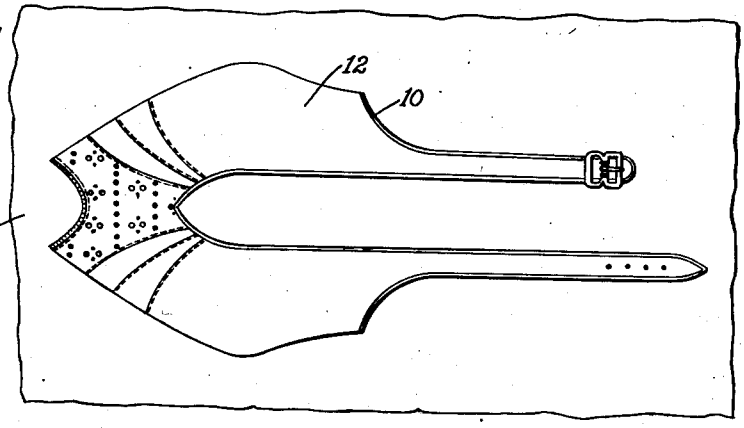
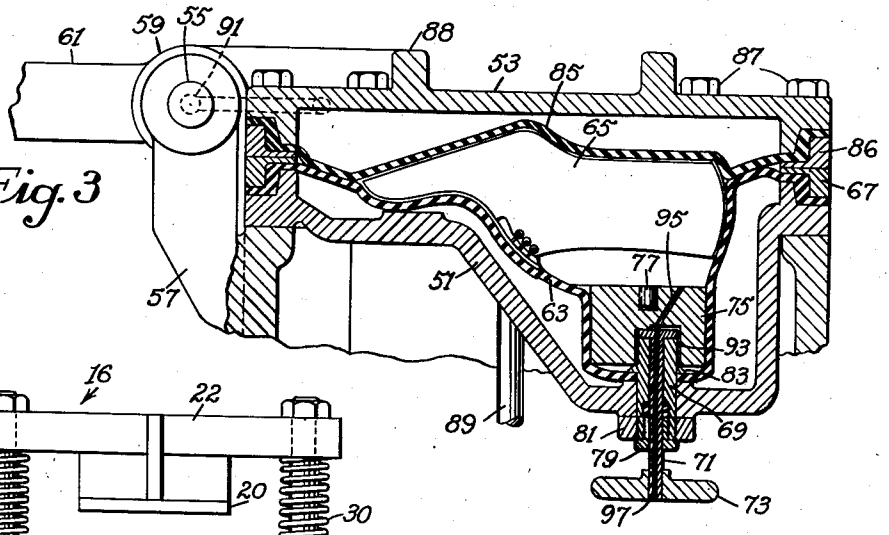


Fig. 3



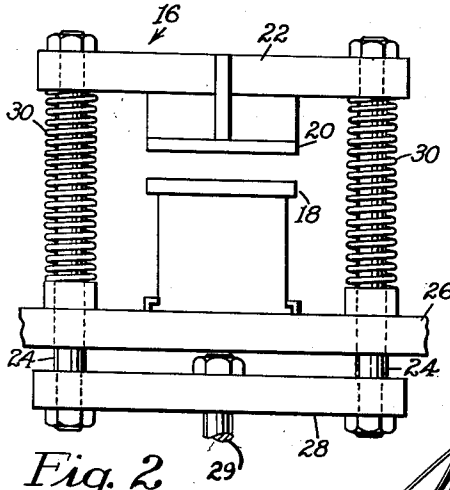
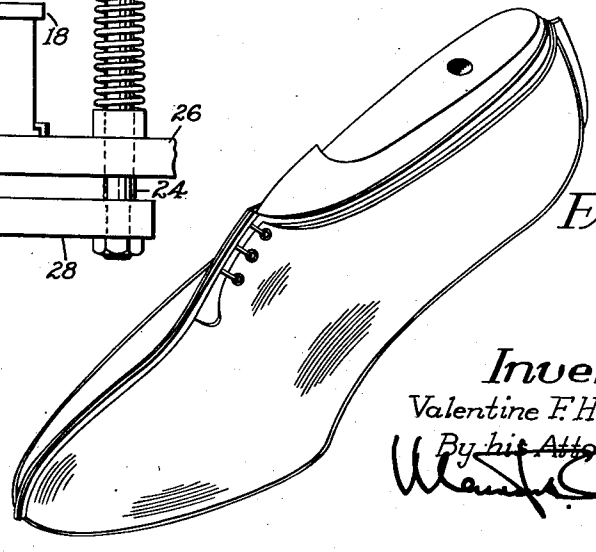


Fig. 2

Fig. 4



Inventor

Valentine F. Harrington

By his Attorney

Patented Sept. 8, 1953

2,651,119

UNITED STATES PATENT OFFICE

2,651,119

ART OF TEMPORARILY COVERING ARTICLES

Valentine F. Harrington, Newton, Mass., assignor to B. B. Chemical Co., Boston, Mass., a corporation of Massachusetts

Application October 30, 1947, Serial No. 783,154

19 Claims. (Cl. 36—72)

1

This invention relates to providing articles with temporary protective covers which may readily be removed when they have served their purpose, and is herein illustrated with respect to protecting the uppers of shoes from being soiled or stained during various shoemaking operations.

In the manufacture of shoes it is desirable to apply to the upper a temporary protective cover which will prevent soiling and/or staining the upper while various shoemaking operations are being carried out and which may be readily peeled off when it has served its purpose. Among these shoe manufacturing operations, depending upon the type of shoe being manufactured, are certain ones in which a pressure of considerable magnitude is exerted upon the toe portion of the upper. For example, in shoes the soles of which are attached by cement a pressure of from 300 to 600 pounds or more per square inch may be applied, through the toe pad of the sole-attaching machine, to a locality in the toe portion of the upper for an interval which may be as long as sixty seconds. Such a pressure of considerable magnitude, which is applied to a locality of the upper during the manufacture of the great majority of shoes, has prevented the use of covers carrying a coating of so-called "pressure sensitive" adhesive to cause them to adhere to the upper. If a cover comprising sheet material having on one side a coating of ordinary pressure-sensitive adhesive is used, a pressure of considerable magnitude upon a locality of the covered upper will increase the adhesion of the cover to the upper, in the area over which the pressure is applied, to such an extent that removal from the upper of that portion of the cover which has been subjected to the heavy pressure will be prevented or seriously interfered with. Moreover, in the manufacture of shoes a temporary protective cover must remain on the shoe for a considerable period which may be as long as two weeks; and if a cover of the kind last referred to, having a coating of tacky pressure-sensitive adhesive, is used, the adhesion of such a cover to the upper increases steadily even if no pressure other than the light finger pressure necessary to attach it to the upper is encountered, with the result that, even in such case, the cover cannot be readily removed.

According to the present invention a novel protective cover is provided on the article to prevent soiling or staining. The cover may be applied by disposing the article with its display surface to be covered in a single layer, and pressing the novel protective cover against the article, with a pressure applied for an interval sufficient to

2

cause it to adhere lightly to the article. This novel cover comprises thin, flexible, non-fibrous sheet material having firmly bonded to one side thereof a coating which will adhere lightly to the article when pressed against it with a pressure of approximately 100 to 500 pounds per square inch for an interval of approximately one to five seconds and the adhesion of which will not objectionably increase if left in place for a considerable period, whereby neither a pressure of considerable magnitude applied later to a locality of the covered article nor the leaving of the cover on the article for a considerable period will interfere with the ready removal of the cover when it has served its purpose.

Referring to the accompanying drawings,

Fig. 1 is a plan showing a spread-out shoe upper and a piece of cover material disposed in position to protect the display surface of the upper;

Fig. 2 is an elevation of a portion of a machine for exerting heavy pressure upon the cover material to bond it to the display surface of the upper;

Fig. 3 is a vertical longitudinal section of a portion of a machine for pressing a cover against the upper of a lasted shoe; and

Fig. 4 is a perspective of a covered lasted shoe.

In accordance with one embodiment of the present invention, an upper 10 of a shoe shown in Fig. 1 as an open heel, open toe sling-back shoe is spread out flat with its display surface 12 in a single layer. The display surface 12 is then covered with a strip 14 of the new protective material in the form of a thin, flexible, non-fibrous film or sheet having on one side a coating which is firmly bonded to the film and which will adhere to the shoe part to be covered, and then only lightly, when the covering material is pressed against said shoe part with considerable force. The shoe upper 10 with the strip 14 of protective material thereon is then placed in a press 16 which may be of the type shown in Fig. 2. This press comprises a stationary platen 18 and a plunger or presser 20, the plunger being fast to a cross-bar 22 carried at the upper ends of two upright rods 24 vertically slidable through bores in a heavy plate 26 which may be the top of a bench upon which the platen 18 rests. A crossbar 28 connects the lower ends of the rods 24, said crossbar being connected to the upper end of a rod 29 to the lower end of which is connected a hydraulically operated piston (not shown), which pulls down the rod 29, and with it the plunger 20, the construction being such that any desired force may be applied to pull down the plunger 20 and to hold it under said pressure for any desired interval. The

springs 30 raise the plunger when the piston is released. Here the strip 14 and the upper 12 (Fig. 1) are subjected to a heavy pressure which may be from 100 to 500 pounds per square inch for an interval of from one to five seconds, the coating on the strip, as has been explained, being of such nature that it adheres only lightly to the upper when a pressure of such magnitude is employed.

Although the coating has been described above as one which will adhere lightly when pressed against the shoe part with a heavy pressure for a short interval, it should be understood that this is a characterization of the nature of the coating and that such a coating may be made to adhere lightly if the pressure is lighter and the time interval is longer. In practice it is preferable to make the time interval short, and to accomplish this a heavy pressure is used. The coating is non-tacky; that is, it will not adhere when pressed against an article with the fingers in the ordinary manner, and is thus quite different from the tacky coatings known as "pressure-sensitive" coatings, commonly used on sheets or tapes, in that "pressure-sensitive" coatings will adhere when pressed lightly, as for example by the fingers of an operator, against a shoe part and then adhesion will increase very materially if allowed to remain for, say, several days. A non-tacky coating such as is employed in the present invention will give the following test. A strip of thin, flexible sheet material 3½ inches wide, having a coating firmly bonded to one side thereof, is pressed against a glass plate in such manner that no air is entrapped. This pressing may be done, for example, by means of a hand-operated rubber roller. The strip is then pulled off at the rate of 30 inches per minute and in such direction that the strip, as it is pulled off, makes an angle of from 15 to 20 degrees with the surface of the glass plate. The pull is a measure of the tack or surface adhesion and in the case of the non-tacky coating of the present invention will not be above 1000 grams, plus or minus 10%. The term "non-tacky" is employed in the specification and claims to define this property.

The marginal portions of the protective covering are cut off and the covered upper placed on a last. Various shoe-making operations such as pulling-over, lasting, roughing the over-lasted margin of the upper during which the over-lasted margin of the cover is removed, and sole-attaching, sole-laying and sole-leveling may be performed; and thereafter, when the cover has served its purpose, it is removed by peeling it from the upper. In the sole-attaching operation, for example, there is commonly applied through the toe pad of the cement-sole-attaching machine a pressure of from 300 to 600 pounds or more per square inch for an interval which may be as long as sixty seconds; and, owing to the nature of the coating on the cover, a pressure of this order will not materially increase the adhesion of the cover to the upper, that is, will not increase said adhesion sufficiently to interfere with the ready removal of the cover.

The cover material has been described in its preferred use for the protection of an upper which can be disposed as a whole in a single plane. Where a closed upper is to be covered, the method may be modified, for example, by folding the rear part, applying strips of cover material crosswise of the upper to both sides of the rear part, severing the strips by cuts at the top and the bottom of the partially covered upper, and then opening the upper, spreading the forepart out so that its display surface to be protected is flat, and applying cover material to the display side of said forepart. Although in the procedure described above the covers are applied to complete uppers, they may be applied, if desired, at any other suitable stage of the manufacture, for example, while the shoe part is in the flat or to the skins out of which the shoe parts are cut.

There has been described above a procedure of applying a cover to a shoe part before it is mounted on a last. Another procedure is one in which the covers are applied after the shoes have been lasted; and Fig. 3 shows a portion of a machine for applying a cover with heavy pressure to a lasted shoe.

This figure shows a pressure box which is substantially like one of the two pressure boxes of the machine of the patent to Stuart No. 1,337,532 dated April 20, 1920. The box comprises a lower member 51 and an upper or cover member 53, the cover being hinged to the frame (not shown) of the machine by means of a shaft 55 passing through an aperture in a stationary bracket member 57 and through an apertured boss 59 projecting rearwardly from the cover member 53. An arm 61 projects from the boss 59 and carries an adjustable weight (not shown) to counterbalance the weight of the cover member. Disposed within the lower member 51 of the pressure box is a flexible diaphragm 63 shaped to conform roughly to the upper portion of a last 65 (herein shown bottom side up), its margins being clamped between the flanged upper portion of the wall of the member 51 and a flanged clamping ring 67. The lower wall of the diaphragm 63 is apertured to receive a bushing 69, a stem 71 being threaded into the bushing so that, when the stem is rotated by means of a handle 73, the stem may be moved upward or downward to adjust the position of a block 75 upon which the last 65 rests, the block being provided with a pin 77 to fit into a hole in the last. At its lower end, the bushing 69 is cored out to receive a packing which is compressed by means of a threaded plug 79. The bushing projects below the lower member 51 of the box and is threaded to receive a nut 81 so that the lower portion of the lower diaphragm 63 may be clamped between the inner surface of the wall of the lower member 51 of the pressure box and a flange 83. The upper diaphragm 85 is clamped in position in the cover member 53 by means of a flanged ring 86 secured in position by a series of cap screws 87. The cover 53 is locked in closed position by latches, not shown, which engage ribs 88 on the cover. Compressed air is forced through a pipe 89 into the space beneath the lower diaphragm and through an axial bore 91 in the pivot-shaft 55 into the space above the upper diaphragm 85. It is desirable that the air between the diaphragms and the lasted shoe be permitted to escape. To this end the last holder or block 75 is provided with ducts 93, 95 in communication with a duct 97 formed in the adjusting stem 71. No further description of the machine will be given, reference being made to the patent for parts not herein referred to.

When this machine is used to carry out the pressing step of applicant's method, a cover of a shape to fit roughly over a lasted shoe is prepared from the same material as that of the strip 14, described above, said cover having on its inner face a coating which will adhere to the upper of the lasted shoe, and then only lightly, when the cover is pressed into place with considerable pressure, for example, a pressure of 100 to 500 pounds per square inch, for an interval of from one to five seconds. A cover of this kind is placed on

the lasted shoe, the cover 53 of the pressure box is raised, the lasted shoe is placed in the pressure box, the cover 53 of the box is closed and locked, and air at the desired pressure is forced into the box above and below the two diaphragms 65 and 63. The resulting product, shown in Fig. 4, is a lasted shoe having a temporary protective cover adhering lightly to its upper so that it may readily be peeled off and yet adhering sufficiently so that it will remain in place during subsequent manufacturing operations and thus protect the upper.

The film or sheet of the covering material may be rubber hydrochloride, sold under the trade name of Pliofilm, although other thin, flexible sheets or films such, for example, as Saran (polymerized vinylidene chloride) or ethyl cellulose may be used. These films possess particularly advantageous characteristics, being tough, transparent, flexible films which are somewhat stretchable. The film may be only .001 of an inch thick, the whole covering material having a total thickness of .0017 of an inch. The capability of stretching and of becoming quickly fatigued is particularly advantageous in the pulling-over operation where the cover material will stretch with the upper without breaking and will not exert an undue pressure when stretched. The thinness, flexibility and transparency of the material greatly aid in the roughing of the overlasted margin of the upper. The roughing operator should begin his roughing cut along the feather line of the insole, that is, along the line of the edge of the insole. Since the cover material is so thin, the feather line of the insole is sharp and clearly visible, and the roughing cut can be very accurately done so as to leave the edge of the cover just on a level with the bottom of the insole. This prevents any cement which may later be squeezed out during the sole-attaching operation from getting upon the upper and allows the sole to make a tight joint with the bottom of the insole. If the cover is thick, the feather line is not sharp, and there is a tendency on the part of the roughing operator to begin the roughing cut too far from the feather line. It may be noted here that the cover material which extends over upon the bottom of the shoe can be removed by the action of the wire brush which is commonly used to rough the overlasted margin of the upper. The removal of the overlasted margin of the cover and the roughing of the overlasted margin of the upper are thus both accomplished in a single operation.

Below are examples of cover materials of the kind described above, each comprising thin, flexible, non-fibrous sheet material having firmly bonded to one side thereof a coating which will cause the sheet material to adhere to the article, and then only lightly, when the cover is pressed against the article with a pressure of considerable magnitude, and the adhesion of which will not increase objectionably if the cover is allowed to remain in place for a considerable interval. In Examples I, II and III, the base coat may be applied to the sheet or film and allowed to dry, after which the top coat is applied over the base coat and allowed to dry. In Example IV, where a single coat is used, this coat is also allowed to dry. In each case the coating material is bonded firmly to the film and all the coating material is peeled off when the film is peeled off.

Example I

The film is Pliofilm (rubber hydrochloride). The base coat is 1% each of Pliolite a condensation derivative of natural rubber and neoprene in 60% Solvesso No. 1 and 40% naphtha. The top coat is 15% Vistanex polybutene (molecular weight about 120,000) in naphtha.

Example II

The film is Saran (polymerized vinylidene chloride). The base coat is 1% chlorinated Vistanex polybutene (molecular weight about 120,000, chlorine content 20%) in 60% Solvesso No. 1 and 40% naphtha. The top coat is 15% Vistanex polybutene (molecular weight about 120,000) in naphtha.

Example III

The film is Pliofilm. The base coat is 1% each of rubber and Durez 5117, a derivative of natural rubber formed by condensing the rubber in the presence of phenol in 60% Solvesso No. 1 and 40% methyl ethyl ketone. The top coat is 12–15% unmilled, uncured rubber in naphtha.

Example IV

The film is ethyl cellulose. The single coat is 15% Vistanex polybutene (molecular weight about 120,000), 1½% Nypene resin and 1½ di-amyl naphthalene in naphtha.

Pliofilm (rubber hydrochloride) and Pliolite (a rubber-derivative cement particularly designed for use with Pliofilm) are put out by the Goodyear Tire & Rubber Company of Akron, Ohio. Solvesso No. 1 (a petrol solvent) is put out by the Standard Oil Company of New Jersey. Saran (polymerized vinylidene chloride) is put out by The Dow Chemical Company of Midland, Michigan. Vistanex polybutene is put out by the Advance Solvents & Chemical Corporation of New York. Nypene resin (polyterpene) is put out by The Neville Company of Pittsburgh, Pennsylvania.

Coatings such as have been described have so little flow that a cover may remain in place for a comparatively long interval, such for example as a week or more, and/or may be subjected to heavy pressure, such for example as that of the toe pad of a cement sole-attaching machine, without having its adhesion increased sufficiently to interfere with the ready peeling off of the cover when it has served its purpose.

Although the invention has been set forth in connection with the covering of a shoe upper, it should be understood that the invention is applicable to the covering of other similar fibrous materials.

Reference is made to United States Patent 2,410,878 which issued November 12, 1946, to the present applicant, and in which related subject-matter is claimed.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A shoe part having adhering to it, in such manner that it may be readily removed when it has served its purpose, a temporary protective cover consisting essentially of a sheet of rubber hydrochloride and a non-tacky adhesive coating formed on said sheet material, said coating being firmly bonded to the sheet and adhering only lightly to the shoe part and being of such nature that when subjected to a pressure as great as 200 pounds per square inch for an interval as long as fifteen seconds its adhesion to the shoe part will not increase sufficiently to interfere with the ready removal of the cover.

2. The combination of a lasted shoe upper and a protective cover thereon comprising a thin,

flexible sheet of rubber hydrochloride having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which adheres lightly to the upper, the coating being of such nature that its adhesion will not be increased to an extent sufficient to interfere with the ready removal of the cover by a pressure as great as 200 pounds per square inch for an interval as long as 15 seconds.

3. The combination of a lasted shoe upper and a protective cover thereon comprising a thin, flexible sheet of rubber hydrochloride having firmly bonded to one side thereof by a base coat comprising a condensation derivative of rubber, a non-tacky coating formed on said sheet material which adheres lightly to the upper, the coating being of such nature that its adhesion will not be increased to an extent sufficient to interfere with the ready removal of the cover by a pressure as great as 200 pounds per square inch for an interval as long as 15 seconds.

4. The combination of a lasted shoe upper and a protective cover thereon comprising a thin, flexible sheet of rubber hydrochloride having firmly bonded to one side thereof by a base coat comprising a condensation derivative of rubber, a non-tacky coating of unmilled uncured rubber formed on said sheet material which adheres lightly to the upper, the coating being of such nature that its adhesion will not be increased to an extent sufficient to interfere with the ready removal of the cover by a pressure as great as 200 pounds per square inch for an interval as long as 15 seconds.

5. The method of temporarily protecting the surface of a fibrous article such as a shoe part which comprises spreading the article flat with the display surface to be protected in a single layer, applying to the article with a pressure of from 100 to 500 pounds per square inch for an interval of from one to five seconds a cover comprising a thin, flexible, non-fibrous, organic sheet material having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which will adhere lightly to the article throughout the extent of the coating when pressed against the article with said pressure, whereby the cover may readily be removed from the article when it has served its purpose.

6. The method of temporarily protecting the surface of a fibrous article such as a shoe part which comprises spreading the article flat with the display surface to be protected in a single layer, applying to the article with a pressure of from 100 to 500 pounds per square inch for an interval of from one to five seconds a cover comprising a thin, flexible sheet of vinylidene chloride having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which will adhere lightly to the article throughout the extent of the coating when pressed against the article with said pressure, whereby the cover may readily be removed from the article when it has served its purpose.

7. The method of temporarily protecting the surface of a fibrous article such as a shoe part which comprises spreading the article flat with the display surface to be protected in a single layer, applying to the article with a pressure of from 100 to 500 pounds per square inch for an interval of from one to five seconds a cover comprising a thin, flexible sheet of ethyl cellulose having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which will adhere lightly to the article throughout the extent of the coating when pressed against the article with said pressure, whereby the cover may readily be removed from the article when it has served its purpose.

8. The method of temporarily protecting the surface of a fibrous article such as a shoe part which comprises spreading the article flat with the display surface to be protected in a single layer, applying to the article with a pressure of from 100 to 500 pounds per square inch for an interval of from one to five seconds a cover comprising a thin, flexible sheet of rubber hydrochloride having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which will adhere lightly to the article throughout the extent of the coating when pressed against the article with said pressure, whereby the cover may readily be removed from the article when it has served its purpose.

9. The method of manufacturing shoes which comprises disposing the upper of a shoe with the display surface to be protected in a single layer, pressing upon the display surface of the upper a cover comprising a thin, flexible, non-fibrous sheet having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which adheres lightly to the upper, performing manufacturing operations on the covered upper one of which includes applying a pressure of from 300 to 600 pounds per square inch for an interval which may be as long as 60 seconds to a portion of the covered upper, and thereafter peeling off the cover.

10. The method of manufacturing shoes which comprises spreading a shoe part flat with the display surface to be protected in a single layer, applying to the shoe part a cover comprising a thin, flexible sheet of organic plastic material having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which adheres lightly to the upper, the coating being of such nature that its adhesion will not be increased to an extent sufficient to interfere with the ready removal of the cover by a pressure as great as 200 pounds per square inch for an interval as long as fifteen seconds, performing manufacturing operations on the covered shoe part including subjecting it to a pressure of the order named, and subsequently peeling off the cover.

11. The method of manufacturing shoes as defined in claim 10 wherein the cover comprises vinylidene chloride.

12. The method as defined in claim 10 wherein the cover material is ethyl cellulose.

13. The method of manufacturing shoes as defined in claim 10 wherein the cover comprises rubber hydrochloride.

14. The method of manufacturing shoes which comprises pressing upon the upper of a lasted shoe a cover comprising a thin, flexible, non-fibrous sheet having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which adheres lightly to the upper, performing manufacturing operations on the covered shoe one of which includes applying a pressure of from 300 to 600 pounds per square inch for an interval which may be as long as 60 seconds to a portion of the covered upper of the shoe, and thereafter peeling off the cover.

15. The method of manufacturing shoes which comprises pressing upon the upper of a lasted shoe a cover comprising a thin, flexible sheet of vinylidene chloride having firmly bonded to one side thereof a non-tacky coating formed on said

sheet material which adheres lightly to the upper, performing manufacturing operations on the covered shoe one of which includes applying a pressure of from 300 to 600 pounds per square inch for an interval which may be as long as 60 seconds to a portion of the covered upper of the shoe, and thereafter peeling off the cover.

16. The method of manufacturing shoes which comprises pressing upon the upper of a lasted shoe a cover comprising a thin, flexible sheet of ethyl cellulose having firmly bonded to one side thereof a non-tacky coating formed on said sheet material which adheres lightly to the upper, performing manufacturing operations on the covered shoe one of which includes applying a pressure of from 300 to 600 pounds per square inch for an interval which may be as long as 60 seconds to a portion of the covered upper of the shoe, and thereafter peeling off the cover.

17. The method of manufacturing shoes which comprises pressing upon the upper of a lasted shoe a cover comprising a thin, flexible sheet of rubber hydrochloride having firmly bonded to one side thereof by a base coat comprising a condensation derivative of rubber, a non-tacky coating of unmilled, uncured rubber formed on said sheet material which adheres lightly to the upper, performing manufacturing operations on the covered shoe one of which includes applying a pressure of from 300 to 600 pounds per square inch for an interval which may be as long as 60 seconds to a portion of the covered upper of the shoe, and thereafter peeling off the cover.

18. The method of manufacturing shoes as defined in claim 10 wherein the cover comprises rubber hydrochloride having firmly bonded to one side thereof by a base coat comprising a condensation derivative of rubber, a non-tacky coating of unmilled, uncured rubber formed on said sheet material.

19. A temporary protective cover for a shoe part to prevent soiling or staining of the shoe part during manufacturing operations, said shoe cover comprising a pair of thin flexible sheets of rubber hydrochloride of such size and shape that when secured at their ends the cover so formed will fit loosely over a lasted shoe and extend over the portions of the shoe to be protected, said shoe cover having firmly bonded to its inner face by a base coat comprising a condensation derivative of rubber, a non-tacky coating comprising unmilled, uncured rubber formed on said base coat, said base coat serving to prevent separation of said non-tacky coating from the rubber hydrochloride sheet in the application of the shoe cover to a shoe part and removal of the shoe cover after manufacturing operations on said shoe part, said non-tacky coating being of such nature that its adhesion will not be increased to an extent sufficient to interfere with the ready removal of the cover by a pressure as great as 200 pounds per square inch for an interval as long as fifteen seconds.

VALENTINE F. HARRINGTON.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,031,673	Schneider et al.	Feb. 25, 1936
2,084,878	Van Cleef	June 22, 1937
2,117,305	Feikert	May 17, 1938
2,142,039	Abrams et al.	Dec. 27, 1938
2,156,380	Drew	May 2, 1939
2,164,981	Alderfer	July 4, 1939
2,319,918	Calvert	May 25, 1943
2,354,855	Emanuel	Aug. 1, 1944
2,357,662	Kemp	Sept. 5, 1944
2,376,777	Kallander	May 22, 1945
2,396,313	Brophy	Mar. 12, 1946
2,410,878	Harrington	Nov. 12, 1946