J. GERRITSON.

PACKING OR LINING MATERIAL AND THE ART OF PRODUCING THE SAME.

APPLICATION FILED APR. 15, 1918.

1,372,947. **Patented Mar. 29, 1921.**

Fig. 1.

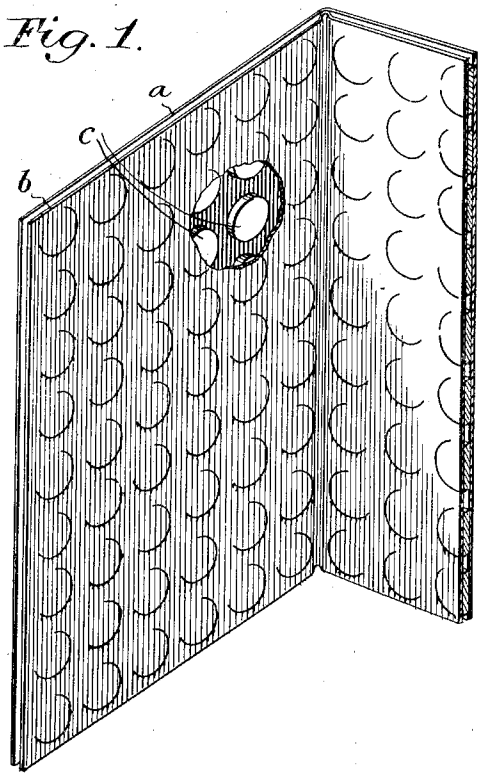
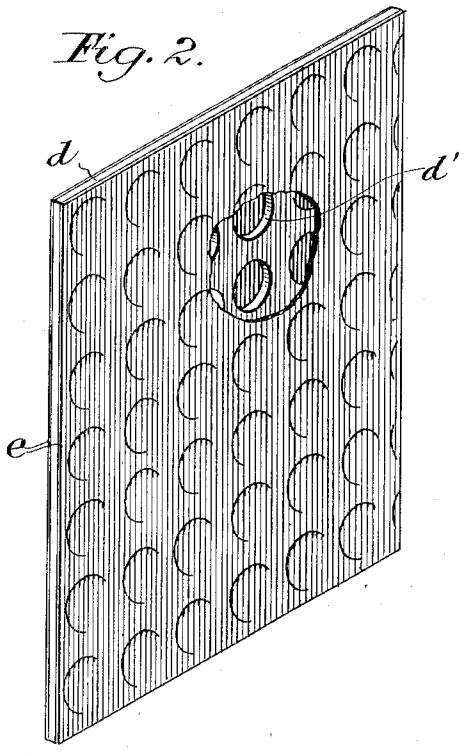


Fig. 2.



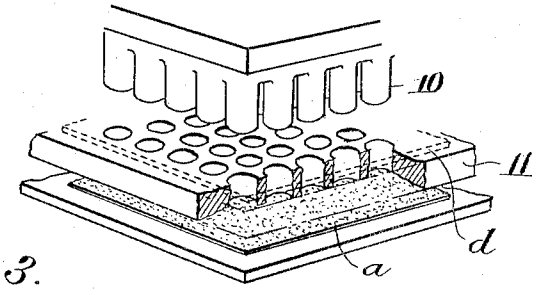


Fig. 3.

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UNITED STATES PATENT OFFICE.

JACOB GERRITSON, OF KANKAKEE, ILLINOIS.

PACKING OR LINING MATERIAL AND THE ART OF PRODUCING THE SAME.

1,372,947. Specification of Letters Patent. Patented Mar. 29, 1921.

Application filed April 15, 1918. Serial No. 228,622.

To all whom it may concern:

Be it known that I, JACOB GERRITSON, a citizen of the United States, residing at Kankakee, in the county of Kankakee and State of Illinois, have invented new and useful Improvements in Packing or Lining Materials and the Art of Producing the Same, of which the following is a specification.

The present invention relates to packing or lining material and to the art of producing the same, and has for its objects the production of composite sheet structures of serviceable character and of forms which provide for the desired packing protection and are at the same time more or less pliable or flexible to permit manipulation during packing operations.

Further objects are to produce composite sheets of this character in a simple and efficient manner and at relatively low cost.

To these and other ends, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the composite sheets and the methods of manufacture hereinafter more fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the views:

Figure 1 is a detail perspective view, partly in section, illustrating one form of packing, parts being broken away to illustrate interior construction.

Fig. 2 is a similar view of another form of packing.

Fig. 3 is a diagrammatic view indicating a step of the method of manufacture.

The particular composite sheet claimed herein practically comprises two sheets *a* and *b* of thin pliable or flexible material united by units *c* of geometrical contour and preferably of uniform thickness, the units being spaced apart and arranged on geometrical lines so that the composite sheet can be folded or manipulated on lines which are located intermediate rows of units.

The particular arrangement of the geometrical units may be varied to take care of particular conditions, but the general preferred arrangement is such as to locate the units in parallel rows and on lines which intersect each other at approximately right angles.

The units are preferably in the form of disks of circular contour, thus presenting no sharp angles to damage the thin sheets or affect the manipulation of the composite sheet.

By this arrangement, the thin sheets are held positively spaced apart at the points of location of the disks, and being adhesively secured to the disks, these particular portions provide practically a solid thickness to the composite sheet. However, the portions of the thin sheets which are not adhesively connected to the disks retain their flexible character, and since these portions of the sheets are normally not connected together, the composite sheet can be bent or folded in either direction between adjacent rows of disks, since the spacing between the sheets at such point is such as to permit the thin sheet of the inner side of the fold to move toward that of the outer side and thus prevent placing any material strain or tension on the structure such as might tend to break or tear the thin sheet. And since the units are arranged in rows extending in different directions, the sheet can be manipulated to meet the various conditions of use.

As will be understood, the serviceability of a composite sheet of this type depends more or less upon the accuracy with which the units are positioned, and this factor becomes of material importance in the commercial use of the sheet. This will be understood from the fact that it is designed more particularly for packing or lining purposes, and should therefore be of low cost in manufacture. On the other hand, the necessity for more or less accuracy in position of the units would, in case of hand manufacture, practically negative such low cost because of the time required in producing the structure as well as the production under comparatively low capacity conditions.

For these reasons, as well as to provide for decreasing the cost of manufacture, I prefer to produce the composite sheet substantially in the following manner, thereby not only providing for manufacture under low cost conditions, but in addition making

possible the production of another product which is serviceable for lining conditions, although the sheet may be otherwise produced.

One method I prefer to employ is to form the units or disks from a sheet *d* of heavy stock of suitable material, such for instance as cardboard, pasteboard, etc. by a punching action, preferably employing a plurality of punches 10 of the desired size and configuration, these punches being arranged somewhat in the nature of a gang punch, the individual punches being arranged to duplicate the spacing of the units or disks of the composite sheet. For instance, the punch may comprise a single punch, a single row of punches, or a plurality of rows of punches, the latter providing for maximum capacity conditions. The punches are preferably located to coöperate with a complemental die, indicated at 11, and the sheet of stock—which may be considered as a foundation sheet—is placed on the die plate. Beneath plate 11 I support one of the sheets—*a* or *b*—preferably with its upper face adhesively coated, thus exposing this coated face to the units or disks which are punched from the foundation sheet by the action of the punches, the units or disks passing through the die plate and on to the positioned thin plate, the latter being properly spaced from the bottom of the die plate in order to permit the desired action, thus applying the disks by a more or less pressure action.

Obviously, should the die plate have a thickness greater than the thickness of the units or disks, and the length of punch movement be such as to retain a disk or disks within the complemental perforation of the die plate, the general result will be the same, the particular disks to be applied being the lower ones of the die plate, whether this one be that which has just been taken from the foundation sheet or one which has been brought to the applying position through the successive introduction of additional disks into the die plate. In this latter case the die member may be considered somewhat in the character of a magazine, the magazine forming a supply source for the disks, the geometrical arrangement of the individual supplies providing for the proper arrangement of the disks on the thin sheet. And while I prefer to provide the disk-producing and disk-applying in the same apparatus and in the manner indicated, it will be readily understood that the invention is not limited in this respect, since the disks may be formed separate and then introduced into the several supplies, after which the individual application would be made by plungers or pressers of the general type of the punches heretofore referred to, it being readily understood that in either case, the disks are applied by pressure and adhesively secured to the positioned thin sheet with the disks arranged on geometrical lines and isolated from each other.

After the disks have been so applied to the positioned sheet, the latter is removed and another thin sheet adhesively applied to the opposite unapplied faces of the applied disks, thus completing the sheet.

The advantage of the preferred arrangement lies in the fact that the desired arrangement of the disks or units is practically provided before the punching action has been had. If a single punch is employed, the foundation sheet can be properly marked on the desired geometrical lines or a templet be employed. If a single row is being utilized, the units of that row will be simultaneously applied and by shifting of punches or of sheets, the proper spacing of the adjacent row can be had. Where the gang punch comprises a plurality of rows, the units or disks of a definite area of the composite sheet will be properly positioned concurrently.

The thin sheets may be of paper or of other material. The foundation sheet may also be of suitable material, but, by reason of the general arrangement of the composite sheet, this foundation sheet may be formed of practically waste material, scraps, etc. which are left over in the formation of some other article. For instance, if the general manufacture is of pasteboard, the waste material can be employed for this purpose, so that the composite sheet is practically the waste material disks or units and the thin sheets of material, providing for a low cost of material required.

While I prefer to employ an adhesively coated thin sheet and apply the disks thereto, it will be readily understood that this may be reversed, and the faces of the disks carry the adhesive and the thin sheet remain free from adhesive, the essential feature being to adhesively connect the disks to the substantially flat sheet.

In addition, the foundation sheet *d* may, itself, form a distinct product by covering its opposite sides with thin sheets *e* of material, thus closing the openings *d'* formed during the disk-punching operation and producing a more or less rigid structure of considerably reduced weight and yet having practically all of the supporting qualifications of a solid foundation sheet used for lining or other packing purposes, the spacing of the openings being on the geometrical lines and spaced apart so as to provide no material weakness to the product. I have not herein specifically claimed this additional product, said product forming the subject-matter of a separate application.

From the above it will be seen that by the use of a foundation sheet of heavy stock, and three sheets of light weight flexible material such as paper sheets, I am able to produce packing or lining sheets of two different types, one being non-flexible—more or less rigid in character—and the other flexible; that these results are obtainable in a simple and inexpensive manner as respects the cost of material and labor, and, since the foundation sheet may be of waste material, the resulting products are practically a by-product of a general line of manufacture. And, as will be readily understood, the methods above pointed out provide for the production under maximum efficiency conditions, in that the entire foundation sheet is put to use in serviceable forms, and with the least expenditure of time.

As will be understood, the thin sheets may be of any desired flexible material, as for instance fabric, paper, etc., the general formation of the composite sheets being such as to permit the use of paper for the purpose and at the same time provide a structure of sufficient strength for ordinary usages.

Obviously, the composite sheet may be of any desired dimensions, it being readily understood that such sheet can be cut into smaller dimensions at the will of the user.

While I have herein shown and described packing or lining materials as articles of manufacture, together with various ways in which they may be produced, it will be readily understood that changes or modifications therein may be found desirable or necessary to meet the exigencies of use, and I desire to be understood as reserving the right to make any and all such changes or modifications as may be found desirable or essential, in so far as the same may fall within the spirit and scope of the invention as expressed in the accompanying claims when broadly construed.

What I claim is:

1. The method of producing packing and lining material having characteristics differing from each other from the same source which consists in subjecting a foundation sheet of relatively heavy stock to a punching action to remove disks therefrom, the punching lines of the heavy sheet extending geometrically and being relatively spaced to isolate the openings from each other, locating the punched disks between adhesively-coated thin flexible sheets with the geometrical arrangement preserved, and applying thin sheets to the opposite faces of the perforate heavy sheet.

2. The method of producing packing and lining material having characteristics differing from each other from the same source which consists in supporting a foundation sheet of relatively heavy stock in spaced relation to the adhesively-coated face of a relatively thin flexible sheet, subjecting the heavy sheet to punching action exerted in the direction of the thin sheet position to remove individual units of geometrical configuration from the heavy sheet and apply them to the adhesive face of the thin sheet, the punching lines of the heavy sheet extending geometrically and being relatively spaced to isolate units relatively to each other, whereby the units will be applied to the thin sheet in the geometrical arrangement of the punching lines, and applying separate flexible sheets to the opposite faces of the heavy sheet and to the opposite unapplied faces of the positioned units.

3. The method of producing packing or lining material which consists in locating a thin sheet of pliable material beneath individual supplies of disks with the supplies arranged in geometrical formations and with disks from adjacent supplies spaced from each other, and applying the disks to and adhesively securing them to the sheet by pressure applied to the disks in the direction of sheet position, whereby the applied disks will be isolated from each other and geometrically arranged, and adhesively applying a second sheet to the opposite unapplied faces of the disks.

4. The method of producing packing or lining material which consists in supporting a sheet of board of relatively heavy stock in spaced relation to the adhesively-coated face of a relatively thin flexible sheet, subjecting the heavy sheet to punching action exerted in the direction of the thin sheet position to remove individual disks from the heavy sheet and apply them to the adhesive face of the thin sheet, the punching lines of the heavy sheet extending geometrically and being relatively spaced to isolate disks relatively to each other, whereby the disks will be applied to the thin sheet in the geometrical arrangement of the punching lines, and applying a thin flexible sheet to the opposite unapplied faces of the disks.

5. As a new article of manufacture, a composite packing or lining sheet comprising two sheets of thin pliable material and an interposed filler consisting of individual units arranged in parallel rows and spaced from each other to provide substantially straight folding lines between adjacent rows of units.

6. As a new article of manufacture, a composite packing or lining sheet comprising two sheets of thin pliable material and an interposed filler consisting of individual units arranged in longitudinal and transverse rows, said units being spaced from each other to provide substantially straight

longitudinal and transverse folding lines between adjacent rows of units.

7. As a new article of manufacture, a composite packing or lining sheet, comprising two sheets of pliable material and an interposed filler consisting of individual disks of uniform thickness cut from sheet stock, said disks being arranged in longitudinal and transverse rows and spaced from each other to provide substantially straight longitudinal and transverse folding lines between adjacent rows of disks.

In testimony whereof I have hereunto set my hand.

JACOB GERRITSON.