March 21, 1933. C. S. HAMERSLEY 1,902,361

CUSHIONING PAD

Filed Feb. 27, 1932

Fig. 1

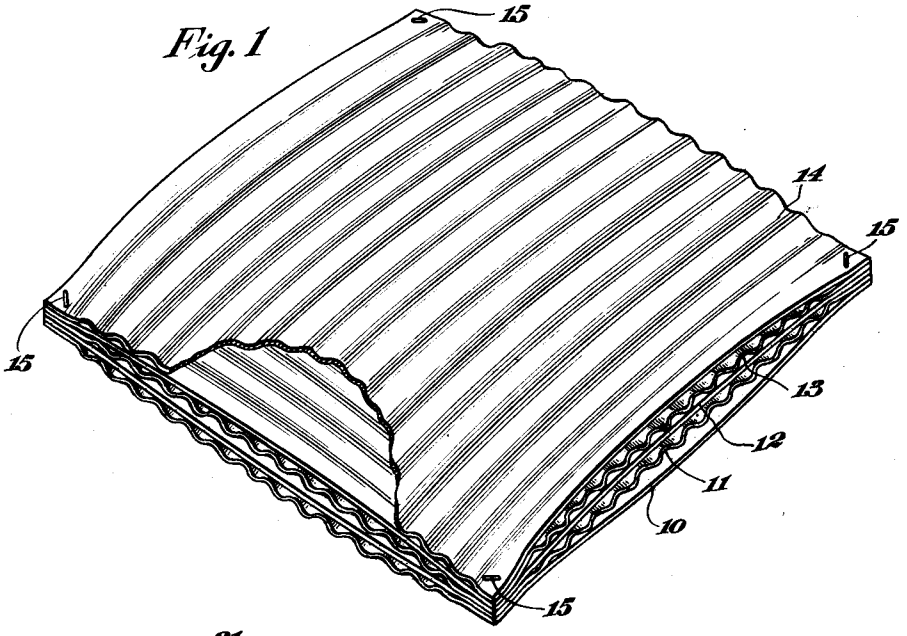


Fig. 2

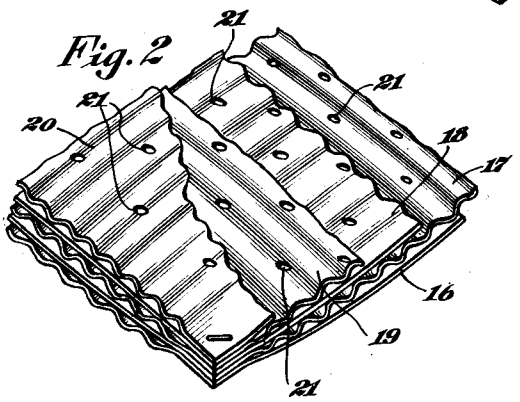


Fig. 4

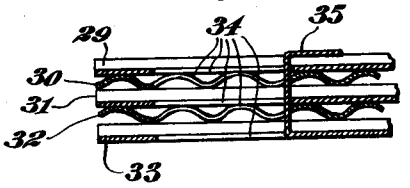
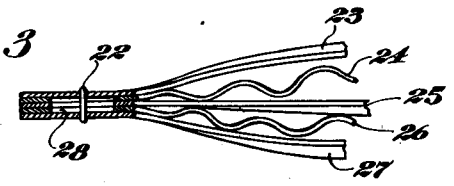


Fig. 3



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UNITED STATES PATENT OFFICE

CARL S. HAMERSLEY, OF NEW YORK, N. Y.

CUSHIONING PAD

Application filed February 27, 1932. Serial No. 595,447.

My present invention relates generally to laminated materials, and has particular reference to an improved cushioning pad. In the packaging and transportation of frangible commodities, such as fresh grapes or fresh pears, it is desirable and customary to provide a padding or cushion on the inside of the crate, usually on the bottom; and frequently, along the sides and over the goods. It has been the practice, for example, to employ a cushion of the more or less conventional character wherein a mass of excelsior or the like is enveloped in tissue paper.

It is one of the principal objects of my present invention to provide an improved cushioning pad of the foregoing general character; and although it is primarily designed and adapted for use in connection with the transportation of such materials as fresh grapes or the like, nevertheless it will be understood that many phases of my invention do not restrict its use to such a specific purpose.

A cushion of the character mentioned must be not only light in weight and especially resistant to crushing, but it must be of particularly great yieldability and resilience, coupled with inherent softness. Furthermore, it should be adapted to absorb or accommodate such fruit juices as may possibly leak from the goods due to accidental crushing of some of the fruit or possible fracture of the fruit skin. Especially in the case of grapes and pears, and similar juicy fruits having tender skins, it is not unlikely that one or more skin fractures will inadvertently exist when the fruit is packed or be caused after the fruit is crated; and this is likely to occur even when the greatest possible care is taken to avoid it. Such fractures result not only in considerable leakage of juices, but render the fruit even more susceptible to further injury.

Another requirement of a padding of the character mentioned is that it be of a character which will not interfere with the free circulation of air through the crate. It is not only essential that the fruit be kept in a fresh condition between the time that it is packed and the time that it is sold, usually at a very remote point, but during the transportation it is necessary that all portions of the crate be accessible to the refrigeration to which the goods are subjected during transit.

In accordance with my present invention, I aim to provide a cushioning pad which complies admirably with all of the foregoing requirements, and which is at the same time inexpensive not only from the standpoint of the material used but also as to manufacture and use.

I have found that corrugated sheet material, such as light and unsized paper, has peculiar properties when a number of sheets of it are arranged in stacked relationship with the corrugations arranged in alternate transverse manner, which permits the provision of a cushioning pad of unusually advantageous characteristics, especially where the pad is to be used for the purpose hereinbefore illustratively specified. My present construction differs from ordinary and conventional corrugated board, however, in that it is not inherently stiff and rigid but, on the contrary, soft and resiliently yieldable, being comparatively massive and truly embodying all the desirable features of a cushion as distinguished from a mere reinforcement or protective.

One of the features of my present invention, as a result of which my present desirable objectives are capable of achievement, lies in the arrangement of a plurality of corrugated sheets in superposed but substantially independent and disconnected relationship. The major portions of the several sheets entering into my present cushion are entirely free from connection with adjacent sheets, as a result of which each sheet is freely adapted to expand or adjust itself in its own plane. Where a stack of sheets, with corrugations arranged in alternate transverse relationship, is provided with this free adjustability of individual sheets, I have found remarkable cushioning qualities and capabilities to result. In order to provide a unitary device capable of easy handling, shipping, and manipulation, it is a feature of my invention to hold the stacked sheets together only at substantially spaced spots,

thereby preventing relative rotation of the sheets but still permitting freedom of adjustment of each sheet in its own plane.

In a preferred embodiment, my present cushioned pad is composed of sheets of polygonal contour, for example, rectangular; and the sheets are stacked in registry and are loosely held together at certain corners, for example, at the four corners of a substantially rectangular pad. Where the cushion is constructed in a substantially rectangular form, I have found further that a binding-together at only the corners produces the highly desirable result of causing the stack to bulge or "belly" at the center. This increases the cushioning qualities, as hereinafter more fully pointed out.

It is another feature of my invention to employ a relatively delicate and frangible binding means whereby the cushioning devices are suitably held together as units only to an extent sufficient for them to retain their unitary nature until they are used. A subsequent breakage of the binding means is thus encouraged, as a result of which still further freedom of independent adjustability of the component sheets is accomplished.

Another feature of my invention lies in associating with a cushion of the present character a chemical or chemicals which are mold-preventive in nature. Sometimes it is also desirable to provide one or more of the sheets, including the outer sheets, with perforations.

I achieve the foregoing objects, and such other objects as may hereinafter appear or be pointed out, in the manner illustratively exemplified in the accompanying drawing, wherein—

Figure 1 is a perspective view of a cushioning pad constructed in accordance with my present invention, a portion being broken away;

Figure 2 is a fragmentary perspective view of a corner of a slightly modified construction;

Figure 3 is an enlarged cross-sectional view through one form of binding means; and

Figure 4 is a view similar to Figure 3, showing a modified type of binding means.

In the embodiment illustrated in Figure 1, I have shown the employment of five superposed sheets 10, 11, 12, 13, and 14. Each of these sheets is preferably composed of relatively light and unsized paper of rectangular shape, and is corrugated in a direction parallel to one of the edges. These layers or sheets are superposed in stacked relationship so that the edges are in registry and so that a substantially rectangular stack is produced. Preferably, the dimensions of the stack are substantially equal to the dimensions of the base of a crate into which the device is to be inserted, it being understood that the grapes or similar commodities are thereafter to be rested directly upon the padding thus produced.

It is to be noted that the corrugations are arranged in alternate transverse relationship, and that there are no intermediate layers of any kind between the several sheets. It is further to be observed that the sheets are not adhesively united, and that they are substantially free and independent, one from the other, except in so far as the binding means hereinafter referred to is concerned.

In Figure 1, I have bound the sheets into a unitary stack by means of four thin and frangible staples 15, these staples being arranged at the corners of the stack. The corrugated nature of the sheets, and the alternate relationship thereof, results in the production of a "bellied" stack, as illustrated.

Merely by way of example, I will state that a device constructed as shown in Figure 1 may be approximately fourteen inches square, and even where only five sheets of paper are employed a thickness of approximately one inch is produced at the center. It will be understood that the drawing is exaggerated for the sake of clearly explaining the invention and that the thickness of each sheet is not proportionately as great as the drawing might seem to indicate. Where a pad of this type is applied to the base of a crate which is used, for example, in the packaging of grapes, an extremely efficient cushioning effect is achieved. The pressure exerted by the grapes (or similar commodities) upon the pad is yieldably counteracted by the pad which is, in a sense, a virtual "air cushion" for the goods. When the pad yields, the individual sheets tend to expand wherever pressure is applied, since the corrugations at such areas are induced to flatten out. The flattening of each sheet is, however, at right angles to the direction in which the adjacent sheet or sheets tend to flatten or expand, as a result of which any given pressure is efficiently distributed and dissipated. Since each sheet has its major portion entirely disconnected from the adjacent sheet or sheets, it is enabled individually and independently to expand in its own plane. If the sheets were united, no such result would obtain, and a rigid and unyielding reinforcement effect, of no cushioning value whatsoever, would probably result.

In Figure 2, I have shown a modification wherein each of a plurality of sheets 16–20 is provided with perforations 21. It will be understood that the perforations 21 are haphazardly provided and that they do not necessarily register with the perforations of the adjacent sheets. Furthermore, although it is desirable to provide these perforations in the outer sheets 20 and 16, it is optional whether they be provided in the intermediate sheets.

The perforations of Figure 2 enhance the

freedom of circulation of air through the cushion, and they serve further to provide additional facility for leaking fluids to be absorbed by and accommodated within the pad itself. Furthermore, where the pad is provided with a mold-preventive of some sort, such as borax or copper sulphate, the perforations 21 increase the dissemination of fumes or the like.

In Figure 3, I have shown a construction wherein a staple 22 is employed to hold five sheets 23–27 in stacked relationship, and wherein the staple 22 engages only the outer sheets 23 and 27. The inner sheets are each provided with an oversized aperture 28 through which the staple 22 may pass. This arrangement enhances the freedom of movement of the intermediate sheets 24–26.

In Figure 4, I have illustrated a binding means of especial frangibility. Five sheets 29–33 are stacked, and are provided with registering apertures 34 through which a tab 35, integrally formed on the sheet 33, for example, may pass. This tab is crimped over the opposite outer sheet 29 in the manner shown, and serves to hold the sheets together as a unit, but since this tab is composed of paper, and since the connection between the sheets is obviously frail, it usually happens that the pad, after it is inserted into the crate, will disintegrate either partially or wholly into its separate individual sheets. When this occurs, the freedom of expansion and adjustability of the individual sheets is enhanced, whereby the cushioning effect is benefited.

Another manner in which a plurality of sheets may be bound together in a frangible manner is by uniting them, at superposed spots, as, for example, in place of any of the staples or tabs illustrated, by means of spots of paste or glue. The sheets would then be virtually "spot welded" to hold them in the form of a unitary stack, and I have found this arrangement satisfactory in holding the devices together to an extent sufficient to permit them to be shipped, handled, and inserted into the desired crates. Thereafter, if one or more of the "spot welds" breaks, it will be only because one or more of the sheets has tended to expand in its own plane, an adjustment that is desirable.

In applying a mold-preventive, as hereinbefore mentioned, it will be understood that I do not mean to limit myself to any particular chemical nor to the employment thereof in either solid or liquid form, or to any particular means of applying or associating it to or with the pad. It may, for example, be sprayed or coated on one or more of the surfaces of the sheets; or it might be accommodated in solid form between the sheets.

Furthermore, it will be understood that my invention is not restricted to any particular type of binding means, and that the staples herein illustrated have been shown merely by way of example. So far as simplicity and efficiency of manufacture and use are concerned, staples arranged as shown in the drawing have proven eminently satisfactory.

It will also be understood that staples or similar binding means need not necessarily be arranged at the corners of the device, although this arrangement has proven to be satisfactory and desirable in many cases, especially where the pad is substantially rectangular.

Furthermore, it will be understood that the individual sheets need not necessarily be five in number, although five stacked sheets provide a pad of approximately those dimensions and characteristics which render it most suitable for the purpose herein mentioned. Also, although the sheets are preferably of absorbent paper, it will be understood that other materials of similar characteristics may be employed where the manner of action and cooperation and the effect produced are substantially equivalent to the description herein contained.

In general, it will be obvious that changes in the details herein described and illustrated for the purpose of explaining the nature of my invention may be made by those skilled in the art without departing from the spirit and scope of the invention as expressed in the appended claims. It is therefore intended that these details be interpreted as illustrative, and not in a limiting sense.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is—

1. A cushion of the character described, comprising a plurality of corrugated sheets arranged in stacked relationship with the corrugations of each sheet arranged transverse to those of each adjacent sheet, each sheet having the major portion thereof free of connection with the adjacent sheet or sheets to permit independent expansion of each sheet in its own plane.

2. A cushion of the character described, comprising a plurality of corrugated sheets arranged in stacked relationship with the corrugations of each sheet arranged transverse to those of each adjacent sheet, and means for holding said sheets together to prevent relative rotation thereof but permitting independent expansion of each sheet in its own plane.

3. A cushion of the character described, comprising a plurality of corrugated sheets arranged in stacked relationship with the corrugations of each sheet arranged transverse to those of each adjacent sheet, and means for holding said sheets together only at substantially spaced spots to prevent relative rotation of the sheets, each sheet thereby having the major portion thereof free of con-

nection with the other sheets so as to be freely expansible in its own plane.

4. A cushion of the character described, comprising a stack of polygonal, corrugated sheets arranged with their corners in registry but with the corrugations of each sheet arranged transverse to those of each adjacent sheet, and means binding the stack into a unit only at certain corners thereof so as to leave the major portions of the sheets free of connection with one another and thereby permit independent expansive adjustment of each sheet in its own plane.

5. A cushion of the character described, comprising a stack of substantially rectangular, corrugated sheets arranged in registry but with the corrugations of each sheet arranged transverse to those of each adjacent sheet, and means arranged only at the corners of the stack for binding it into a unit, each sheet being thereby freely expansible in its own plane.

6. A cushion of the character described, comprising a plurality of corrugated sheets arranged in stacked relationship with the corrugations of each sheet arranged transverse to those of each adjacent sheet, each sheet having the major portion thereof free of connection with the adjacent sheet or sheets to permit independent expansion of each sheet in its own plane; certain sheets, including the outer ones, being provided with perforations.

7. A cushion of the character described, comprising a plurality of corrugated sheets arranged in stacked relationship with the corrugations of each sheet arranged transverse to those of each adjacent sheet, each sheet having the major portion thereof free of connection with the adjacent sheet or sheets to permit independent expansion of each sheet in its own plane; and a mold-preventive carried by said sheets.

8. A cushion of the character described, comprising a plurality of corrugated sheets arranged in stacked relationship with the corrugations of each sheet arranged transverse to those of each adjacent sheet, each sheet having the major portion thereof free of connection with the adjacent sheet or sheets to permit independent expansion of each sheet in its own plane; a mold-preventive carried by said sheets, and certain sheets, including the outer ones, being provided with perforations.

9. A cushion of the character described, adapted to bolster crated commodities such as fresh grapes, comprising a stack of corrugated, absorbent paper sheets arranged with the corrugations alternately transverse to one another, and means binding the stack into a unit only at substantially spaced spots, whereby the sheets are freely and independently adjustable in their own planes.

10. A cushion of the character described, comprising a stack of corrugated paper sheets arranged with the corrugations alternately transverse to one another, and frangible means binding the stack into a unit only at substantially spaced spots.

11. A cushion of the character described, comprising a stack of corrugated paper sheets arranged with the corrugations alternately transverse to one another, and staples binding the stack into a unit only at substantially spaced spots, the inner sheets being provided with oversized apertures through which the staples pass.

In witness whereof I have signed this specification this 23 day of February, 1932.

CARL S. HAMERSLEY.