Sept. 16, 1941. I. HILL 2,256,024

APPARATUS FOR STACKING ARTICLES

Filed Nov. 24, 1939

Fig. 1.

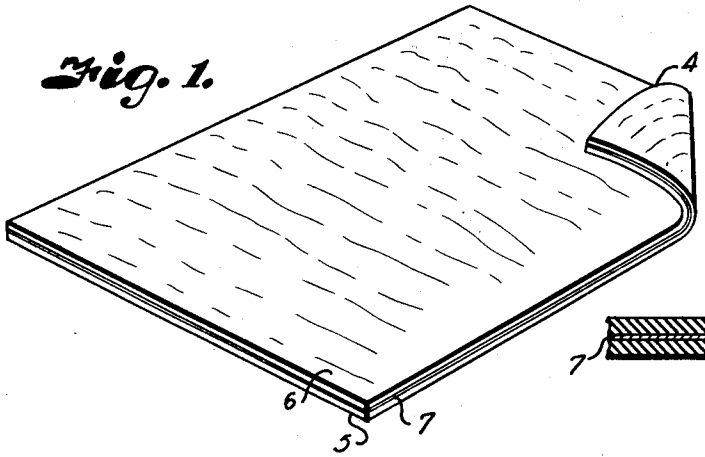


Fig. 2.

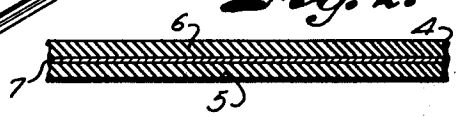


Fig. 3.

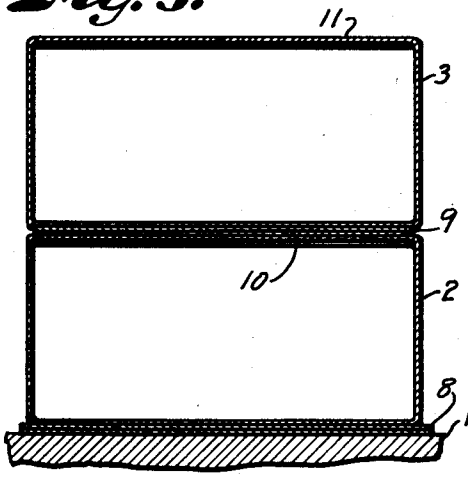


Fig. 4.

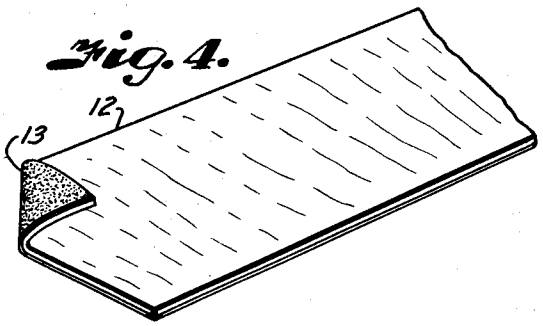


Fig. 5.



Fig. 6.

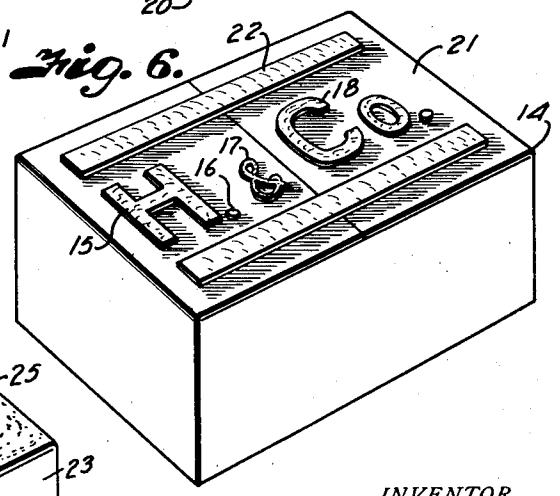
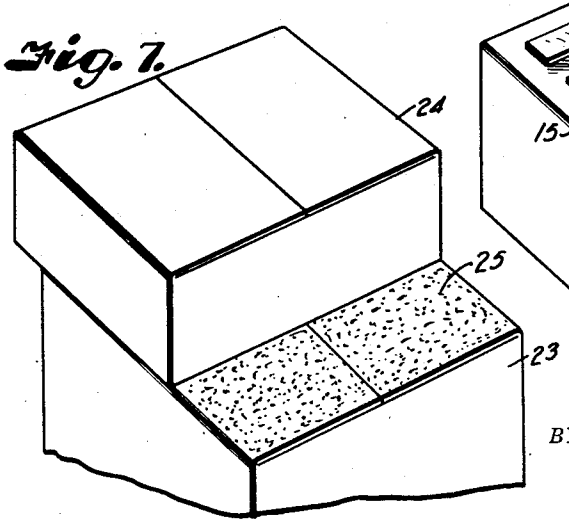


Fig. 7.



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APPARATUS FOR STACKING ARTICLES

Irving Hill, Lawrence, Kans.

Application November 24, 1939, Serial No. 305,953

1 Claim. (Cl. 214—10.5)

This invention relates to apparatus for stacking articles and more particularly to an arrangement for maintaining articles, such as filled bags, boxes and the like, in desired juxtaposed and/or superimposed relation during and after stacking thereof; the principal objects of the invention being to provide a highly convenient, economical and efficient method and apparatus of the character noted.

The present invention is peculiarly applicable to the problems of shipping articles, and especially articles of similar size, shape, weight and the like, in relatively great numbers, in which art it has heretofore been the practice in shipping bags of cement, for example, by rail to stack the bags, in pyramid fashion, over the trucks and axles of the car, and to provide sufficient dunnage and/or bracing structures to prevent shifting of the load. Suitable bracing and adequate dunnage is equally, if not more, important in transporting loads by ship, truck, airplane and the like, for the reason that a shifted, unbalanced load sometimes produces disastrous effects on conveyances of the load, as well as the load itself and its constituent articles.

In shipping loads of stacked articles in which weight is not a necessarily important factor, much valuable space is occupied in the load conveyance by bracing structures to hold the articles in desired position. The cost of such structures, inclusive of the labor and inconvenience incident to the erection and dismantling thereof, is by no means inconsequential.

Other objects of the invention are, therefore, to substantially obviate the difficulties heretofore tolerated in the noted field or art; to provide for holding stacked articles in separated or spaced relation, whereby articles, such as receptacles of fresh tomatoes, green beans or other perishables may be properly ventilated, refrigerated or spaced for other desired purposes; and to provide improved steps and series of them, as well as improved devices and arrangements of them, in carrying out the present invention.

In accomplishing these and other objects of the invention, I have provided apparatus, exemplary forms of which are illustrated in the accompanying drawing, wherein:

Fig. 1 is a perspective view of a device constructed in accordance with the present invention, and adapted to carry out the method thereof.

Fig. 2 is a detail vertical cross-section through a portion of the device shown in Fig. 1.

Fig. 3 is a vertical cross-section through a support and a plurality of articles showing friction increasing devices arranged therebetween in accordance with the present invention.

Fig. 4 is a detail perspective view of another form of friction increasing device constructed in accordance with the present invention.

Fig. 5 is a detail vertical cross-section through a portion of the friction increasing device shown in Fig. 4.

Fig. 6 is a detail perspective view of an article to which friction increasing devices of various frictional shapes have been applied in accordance with the present invention.

Fig. 7 is a detail perspective view of a plurality of stacked articles showing the application of another form of friction increasing device applied therebetween.

Referring more in detail to the drawing:

1, Fig. 3, designates a suitable support which may, for example, consist of the flooring of a railway box-car, truck, ship, airplane or other conveyance, that may be employed for storing and/or transporting articles 2 and 3, such as boxes, adapted to contain a variety of contents.

When such articles are stacked on such supports in juxtaposed and superimposed relation, movements of the support or conveyance ordinarily cause the articles to become unbalanced with the result that the articles shift and are displaced from their desired relation of arrangement, and often cause loss of the contents of the articles or damage to the support.

The present invention contemplates the primary step of applying friction increasing devices to and/or between the stacked articles and/or between the support and article or articles in a stack to hold the articles in stacked relation and to space the articles for ventilating, refrigerating and other purposes.

In carrying out the noted step, it has been found convenient to provide a device 4 for increasing sliding frictional resistance between supporting and supported members such, for example, as shown in Fig. 1, which device may consist of non-slip members 5 and 6, such as films, particles or sheets of rubber, rosin, sand, adhesive materials and the like arranged on opposite sides of a backing member 7, such as paper or other suitably fabricated material.

The friction increasing devices 4 may be shaped in various sizes and conformations, a relatively large friction increasing member 8 being shown in Fig. 3, as applied to the support 1 in contact with the lower surface of the article 2.

A friction increasing device 9 of the character

shown in Fig. 1 and of a size different from and preferably smaller than the device 8 in Fig. 3 may then be applied to the upper surface 10 of the article 2 for immediately supporting the article 3 in relatively fixed non-sliding relation to the article 2. Similar non-friction devices may then be applied to the upper surface 11 of the article 3 for engagement with the bottom surface of another article superimposed thereon for continuing a stack of articles from the support 1 to the upper limits of the conveyance or receptacle of which the support 1 forms a part.

It has also been found convenient to provide a film of friction increasing material 12, Fig. 4, with a backing 13 of adhesive character in such a manner as to facilitate its application to an article 14, Fig. 6, for example, in frictional shapes of desired character, such as indicia 15, 16, 17 and 18 for representing an identification of the sender or intended recipient of articles so provided with the friction increasing devices.

In Fig. 5, another form of friction forming device is illustrated, wherein a film of friction increasing material 19 is provided with a backing 20 of paper or the like, this form of the invention providing for contact of the friction forming material 18 with an article placed thereon. It is contemplated that the backing 20 of this form of invention may consist of a surface of an article such as the top surface 21 of the article 14, the friction forming material in such an instance being given a shape, for example, as indicated at 22, Fig. 6, for supplementing the variously shaped friction increasing device 15 to 18 in maintaining the desired stacked relation of articles superimposed on the article 14.

A modification of the present invention is illustrated in Fig. 7, wherein articles 23 and 24 are arranged in stacked relation, one above the other, and provided between the contacting surfaces thereof with friction increasing devices 25 preferably in the form of particles, such as comminuted rubber, rosin or the like, which may be dusted on the upper surface of the article 23 or spread thereon in a suitable manner, and by which the devices 25 may contact the lower surface of the article 24 to maintain the position of the article 24 in which it was originally arranged.

It is believed apparent, therefore, that with the provisions contemplated by the present invention, articles may be stacked in desired juxtaposed or superimposed relation and maintained in the desired given relation without the use of dunnage, bracing structures, and without accidental displacement of the stacked arrangement of the articles, and that such stacking of the articles and maintenance of their arrangement relative to each other is accomplished in a convenient, economical and efficient manner by the method and apparatus performed and arranged in accordance with this invention.

It is also apparent that the stacked articles are spaced in such a manner as to provide for properly ventilating and refrigerating the contents of the articles.

What I claim and desire to secure by Letters Patent is:

In a device of the character described, a substantially plane sheet, opposite faces of said sheet being of adhesive character relative to contacting surfaces of stacked articles.

IRVING HILL.