

Jan. 21, 1936.

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2,028,431

METHOD OF COMPRESSING COMPRESSIBLE MATERIAL INTO A SOLID PACK

Filed Dec. 20, 1933

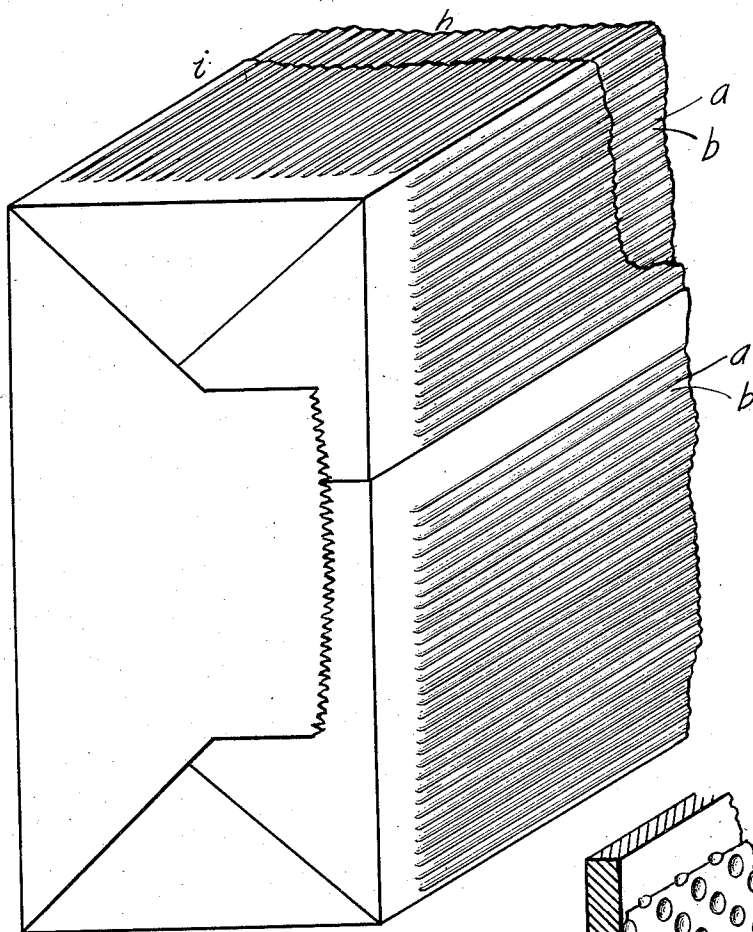


Fig. 1.

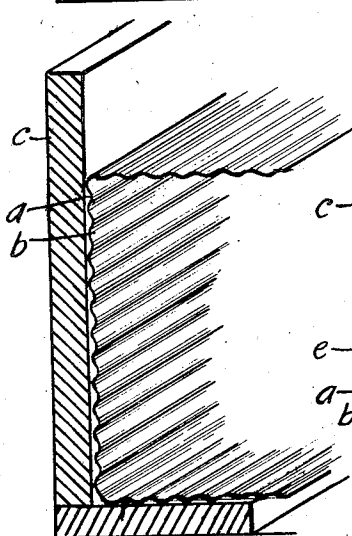


Fig. 2.

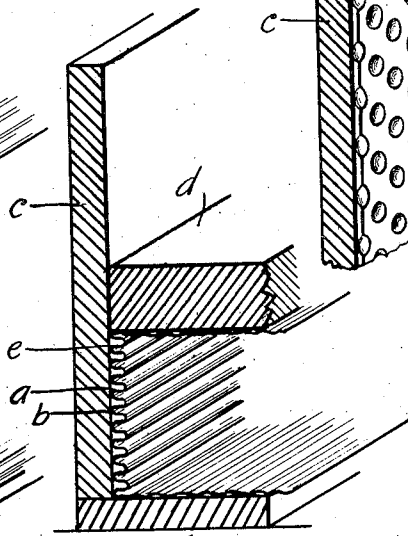


Fig. 3.

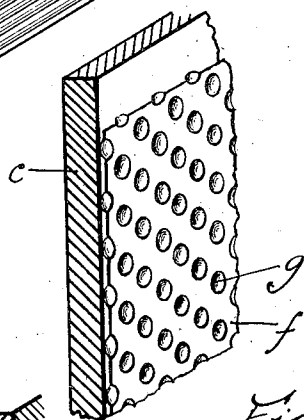


Fig. 4.

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2,028,431

METHOD OF COMPRESSING COMPRESSIBLE
MATERIAL INTO A SOLID PACK

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Application December 20, 1933, Serial No. 703,232

1 Claim. (Cl. 100—14)

My invention relates to the packing of carbon black for shipment. Carbon black is filled in a paper bag at the plant where produced. The bag is then sealed, placed on its side in the press box and the bag and contents are then subjected to pressure applied to one side by a hydraulic press until contents have been compressed into a solid brick. In such compression the original bulk of the carbon black is approximately reduced one-half.

In order to compress the paper bag with its content of carbon black in the press box, it is essential that the bag walls move freely in the press box, since otherwise the bag walls will be cut and torn, and the pack destroyed.

It was heretofore discovered that the paper bag is best made of two plies, the outer ply preferably being smooth finished, and the inner ply rough finished, and further to prevent the bag walls sticking to the sides of the press box, the outer ply of the bag is impregnated with a lubricous substance such as a light mineral oil.

When the outer ply is so impregnated, the bag wall sides slip more easily in the press box, and thus resistance of the packed bag to compression into a brick is somewhat eliminated. But, since the outer ply, as well as the interior surfaces of the side walls of the press box, are smooth finish, on account of the very close intimate contact between these two surfaces there still exists, notwithstanding the lubricating treatment of the outer ply of the bag, a tendency to set up such undue frictional contact as to cause the bag walls to resist movement in the press box, and as a result tear the bag walls in the compression of the pack.

I have discovered that said undue frictional contact between the bag sides and the press box sides may be greatly reduced by roughening the outer surface of the bag. Such roughening may be effectively produced by corrugating, crimping, or creasing the paper of which the bag is made, thus distorting its surface permanently into alternate ridges and grooves extending in the direction of the long dimension of the bag. Such crimping has a two-fold object and effect.

First, it greatly reduces, as mentioned, the frictional contact between bag sides and side walls of the press box in the compression of the pack. Probably, further, the offset portions of the paper hold entrapped air which serves to separate, to some effective extent, the bag sides from the press box walls.

Second, it promotes the plaiting and crushing down of the paper along the side walls of the

press, as the press head descends upon the packed bag, since, by the preliminary plaiting of the paper, the sides of the bag are already adapted to facilitate the said plaiting and crushing down of the bag walls.

Preferably the bag walls are impregnated with a lubricous substance for rendering and maintaining the bag walls soft and pliable, and facilitating their slippage and crushing down in the press box in the compression of the pack.

A paper bag embodying my invention, as in practice, is illustrated by the accompanying drawing; which, however, is to be understood as merely diagrammatically illustrating the features of my invention.

In said drawing:

Fig. 1 shows a perspective elevation of the bottom end of my improved paper bag;

Figs. 2 and 3 illustrate how my improvement facilitates the compression of my paper bag after having been filled with fluffy material; these figures, however, merely show in outline the walls of the bag itself, for clarity omitting any representation of its contents in the drawing; thus Fig. 2 shows a fragmentary perspective cross section of my bag (assumed to be filled) placed sidewise, for compression of the pack, in the press box, and illustrates the creasing of the bag walls lengthwise in conformity with my improvement, the bag walls being supported by a wall of the press box;

Fig. 3 shows a similar cross section as Fig. 2; also represents a bag, assumed to be filled, placed sidewise in the press box, the plunger head of which is now assumed to have been brought down on the pack so as to cause the plaiting and crushing down of the packed bag into a brick, in the press box; and

Fig. 4 represents a sectional fragmentary portion of a side wall of my paper bag, which in this illustration has its surface roughened by producing in the paper knob-like, outwardly protruding portions, functioning to reduce the surface contact between the walls of the paper bag and the press box.

In the type of my paper bag as illustrated by Fig. 1 the sheet from which the bag is made has its surface permanently distorted by suitable means provided in the machine for converting the paper into bag making blanks to produce crimping or creasing of the paper and thus alternate ridges *a* and grooves *b* extending in the direction of the long dimensions of the bag.

As evident, such longitudinal crimping pro-

duces a two-fold result. The most important of these concerns the contact between the bag sides and the side walls of the press as the press head descends upon the packed bag in the operation of compressing the pack.

In Figs. 2, 3 and 4, *c* represents diagrammatically a fragmentary section of one wall of the press box, and in Fig. 3 *d* represents the plunger of the press box causing the plaiting and crushing down of the longitudinal creasings of the walls of the paper bag as indicated by *e*.

In Fig. 4 *f* represents a fragmentary side wall section of a paper wall which in this instance has its surface roughened by producing therein knob-like exterior protrusions as indicated by *g*.

In Fig. 1 the paper bag is represented to be of two-ply construction, the plies indicated by *h* and *i*, but that merely illustrates the usual mode in which paper bags intended to serve for packing carbon black are made.

As above mentioned, where the side walls of the paper bag are not provided with exterior offset portions, preferably consisting of alternate ridges and grooves extending in the direction of the long dimensions of the bag as indicated by *a* and *b*, there is a tendency to set up such undue frictional contact between the bag walls and the walls of the press box, that, notwithstanding the bag walls are impregnated with a lubricous substance, they offer such resistance to their plaiting and crushing down in the press box as to cause the tearing of the bag walls and thus the spoiling of the pack. With my improvement such result is prevented.

In order further to facilitate the movement of the bag walls against the sides of the press box, it is best that the bag walls—if made of two plies, then the outer ply thereof—be impregnated with a lubricous substance to maintain the bag walls pliable, also to promote their slippage in the press box; since without such impregnation the resistance of the bag walls to said movement is still so great as to cause considerable tearing of the bags in the compression of their packs.

I claim:

In the method of compressing into a solid pack, by the aid of a press box, a package comprising a paper bag holding compressible material, the improvement which consists in pre-forming the walls of the paper bag, before filling and insertion of the package into the press box, with ridges and depressions extending transversely of the line of compression force applied to the pack, whereby the continuity of the surfaces of the walls of the paper bag opposed to the side walls of the press box will be broken and only a reduced portion of the paper bag surface will be brought into direct contact with the walls of the press box, facilitating the movement of the walls of the paper bag against the walls of the press box during the compression of the pack, and whereby the depressions furthermore will hold entrapped air thus aiding in the separation of a substantial portion of the walls of the paper bag from the walls of the press box.

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