CARBON BLACK PAPER BAG AND PACKAGE


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4 Claims. (Cl. 206—46)

My invention relates to packing for shipment of carbon black. Carbon black is an extremely light, fluffy substance, comprising in the first instance some 95% occluded gases and 5% carbon black particles, so that it might almost be called a fluid substance. This fluffy substance is filled in a paper bag at the place produced and the bag with its contents is then subjected to very heavy pressure in a hydraulic press, forming the same into a solid brick, convenient for handling and shipment. The bag is then sealed and may be slipped into a cover bag.

When filled into a paper bag, for compression into a brick, the carbon black is made up of about 35% gas (mainly air) and 65% solid carbon particles in a very finely divided, near fluid state. The compression operation reduces this bulk of carbon-black approximately one-half. Therefore during the compression operation enough occluded gas must be expelled, that is escape thru the walls of the paper bag, to permit said compression, otherwise the bag would burst.

The paper bag used for packing carbon black must be made of two plies. The inner ply sheet must have a rough finish, so that while the bag is filled with the fluffy carbon black, the latter will not blow out or "boll over" as it is called. The outer sheet must have a smooth finish, and as I found must be rendered lubricous, thus slippery, so that when the filled bag is compressed into a brick, the outer ply of the bag walls will not resist movement, but instead move easily and freely in relation to the inner ply, and especially in the press box.

In other words, when the said surface friction of the bag is not eliminated its outer ply has a tendency to stick to the walls of the press-box and to resist movement accommodating the forming of the brick, and under the great pressure used if the bag does not take shape readily, its walls are cut and torn, and the pack is destroyed.

It has been attempted to remedy such friction resistance of the bag in the press-box by olling the interior of the latter; but this expediency is very unsatisfactory, since the amount of oil can not be conveniently controlled, and the press box would require frequent cleaning.

I have discovered that when the outer ply of the bag is impregnated with a lubricous substance, for example, a medium light mineral oil, the surface friction of the bag is eliminated and it accomplishes the forming of the carbon black brick without breaking of the bag in the press box.

Furthermore, by impregnating the outer ply of the bag with a lubricous substance it is rendered soft and pliable and is placed in condition to protect the bag as a whole from loss of moisture.

This is important, for in case the paper of the bag becomes abnormally dry, stiffness of its component sheets or plies occurs which would permit the bag-wall to spring away from the carbon brick and cause the latter to collapse; while with the lubricous treatment of the outer ply it retains its softness, pliability and moisture-retaining condition, and the brick form of the pack as a whole is retained, so that the carbon brick can not collapse.

Referring now to the accompanying drawing, I illustrate one embodiment of my bag. In the drawing:

Fig. 1 shows a perspective view of my bag with portions broken away to disclose the inner and outer plys;

Fig. 2 shows a view taken on the line 2—2 of Fig. 1 and illustrates how the outer plys are secured together by "spot" pasting; and

Fig. 3 shows a fragmentary section view of my bag taken similarly to Fig. 1 and illustrates how the tube seams of the plys are interlocked one with the other to prevent splitting at the seams.

With reference to the drawing, I use for the inner ply a of my bag a rough or low finish—preferably 40 pound sheet—having a porosity of 25–40 seconds densometer test; and for the outer ply b I use a smooth or high finish—preferably 30 pound sheet—having a porosity of 20–28 seconds densometer test.

My experiments have shown that papers having a porosity approximately as described will permit the escape of the gases and air occluded in the fluffy carbon black while the paper bag filled with the same is being pressed into brick form.

The inner ply takes up some of the lubrication of the outer ply, and the two plies are thus adapted to adjust themselves readily to each other, facilitating the forming of the brick in the press.

The walls of the bag must have the property of slipping against the wall sides of the press box, along with the moving press-head, and the plies composing the walls must gather themselves into plait or folds in order to conform themselves to the brick shape. If the walls of the bag tend to stick so tightly to the walls of the press box as to resist movement by the plunger
of the press the bag walls will tear or rupture, and the pack is destroyed.

The moving of the lubricated bag walls in the press box, while forming of the brick, and in the removal of the pack from the press, also serves to wipe the press box clean of the dust which otherwise gathers therein, in the operation of the press. The walls of the press box are coated with a film of the lubricant from the bag walls.

The lubrication of the outer ply of the bag also facilitates removal of pack from the press box, and the slipping of the pack into a cover bag. A rough finish of the inner ply a of the bag is necessary as mentioned so that the carbon black will not "boil over" that is, blow out while the bag is filled at the packing machine.

The outer ply b may be rendered lubricious by treatment or impregnation with an oleaginous material, for example a small percentage by weight of so-called oronite technical oil, or other medium light mineral oil.

I have applied the oil to the outer ply b after its production in the paper making machine, but the oil may also be applied in the machine before the sheet is calendered.

Talc and similar substance could also be used for rendering the outer ply lubricious; such material being applied in the beater with the stock furnish; or the talc or similar solution might be applied as the sheet is passed thru the paper making machine; the amount of lubricant being determined relatively to weight of the sheet treated.

The bag is made in one operation from the two-ply plies a, b above referred to in the usual way, except the two plies are secured together by their tube-seams being interlocked. I have illustrated this in Fig. 3, in which the end a' of the inner ply is glued to the adjacent end b' of the outer ply and the opposite ends a2, b2 of the inner plies are carried beyond the portions a', b' and glued to the plies a, b, respectively. This eliminates the splitting of the bag at the seams while drawn over the packer spout. The plies may further be secured together by spot pasting of the walls of the bag as indicated at c.

The porosity of the paper from which the plies are made is quite important, since a considerable amount of air and occluded gas must escape thru the bag walls rapidly as the bag with its carbon black contents is pressed into brick form in the hydraulic press, for otherwise the bag would burst during the compression of the pack into a brick.

I claim:

1. A paper bag for packing carbon black and similar fluffy material comprising inner and outer plies made of sheets having sufficient porosity to permit the gases and air occluded in the pack to pass thru the bag walls during the compression of the bag into lesser bulk in a press, the outer ply having a small amount of lubricant, whereby to render the plies soft and pliable, and adapt the bag walls to move freely in the press box and to adjust themselves while the bag is being compressed.

2. A paper bag for packing carbon black and similar fluffy material comprising inner and outer plies made of sheets having sufficient porosity to permit the gases and air occluded in the pack to pass thru the bag walls during the compression of the bag into lesser bulk in a press, the outer ply consisting of a smooth finish sheet holding a small amount of lubricant for the purpose described.

3: A paper bag for packing carbon black and similar fluffy material comprising inner and outer plies made of sheets having sufficient porosity to permit the gases and air occluded in the pack to pass thru the bag walls during the compression of the bag into lesser bulk in a press, the inner ply consisting of a rough finish sheet, and the outer ply consisting of a smooth finish sheet holding a small amount of lubricant, for the purpose described.

4. A carbon black solid pack impregnated in a two-ply paper bag container, the outer ply of which is impregnated with a small amount of lubricious substance maintaining the bag walls soft and pliable, preventing them from springing outward, and the collapse of the pack.

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