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CARBON SET OR FILE

Filed June 7, 1926

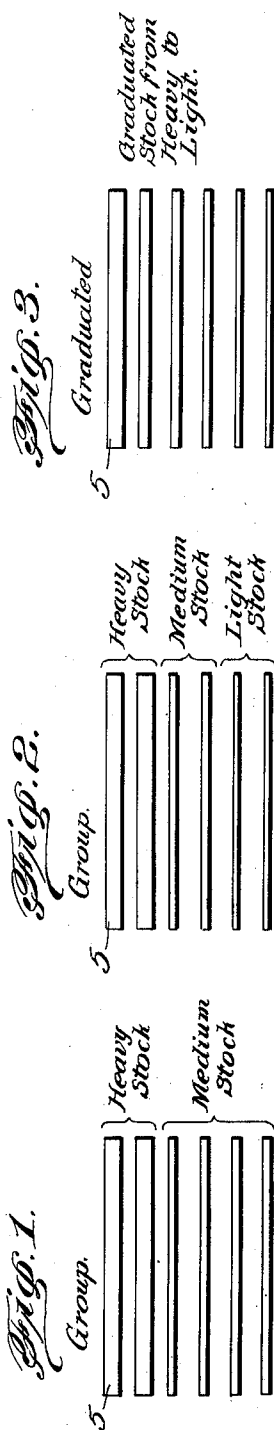
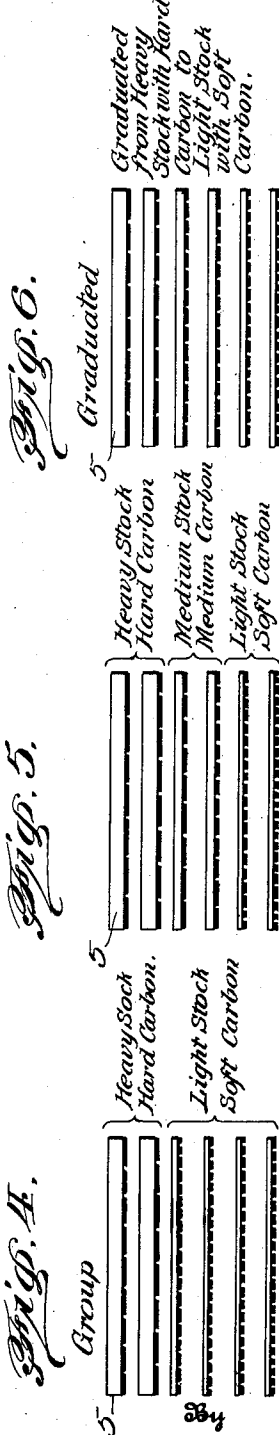
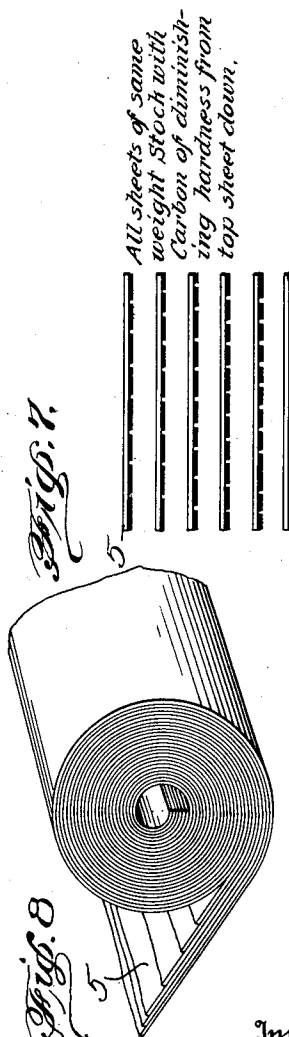


Fig. 8.

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UNITED STATES PATENT OFFICE.

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CARBON SET OR PILE.

Original application filed February 27, 1925, Serial No. 11,995. Divided and this application filed June 7, 1926. Serial No. 114,273.

This invention relates to an improved carbon roll, set or pile and to the method for producing the same.

The object of the invention is to increase the average durability and manifolding qualities of the carbon sheets of a set, pile or roll of carbons to be used in manifolding for instance as set forth in my co-pending application Serial No. 11,995, filed February 27, 1925, and of which the present application is a division.

Another object of the invention is to reduce the manufacture of a carbon set, regardless of form, to a comprehensive method of procedure.

In the accompanying drawings:

Figure 1 is a diagrammatic view of the carbon strips or webs, the uppermost pair of which are of somewhat heavier paper stock.

Figure 2 is a similar view, showing the webs arranged in groups, each of a different weight of stock.

Figure 3 is a view indicating the arrangement of the carbon strips in graduated weights of stock.

Figure 4 indicates the composition of a roll in which the weight of stock is similar to Figure 1, but distinguished by the coating of the heavier carbon strips with a relatively hard carbon surface and the lighter stock with a relatively soft carbon composition.

Figure 5 shows a roll composition similar to that shown in Figure 2, as to weight of stock, but with each group of strips from the bottom upward treated with progressively harder manifolding material.

Figure 6 shows the strips of graduated stock, as in Figure 3, but with the sheets treated with manifold material graduated in degrees of hardness from a soft formula at the bottom to a very hard single copy formula on the top sheet.

Figure 7 shows all the strips of the same stock, but with a gradual increase of hardness of the manifolding material from the bottom up and,

Figure 8 is a perspective view showing a set of strips or webs assembled in the form of a carbon roll.

A source of carbon mutilation is more or less inherent in the carbon paper and in its mode of use in manifolding machines. Obviously, when a large number of paper webs are employed and a correspondingly large

number of carbons, the printing mechanism must be capable of very heavy manifolding action. This has resulted in the comparatively rapid mutilation of the top sheets by the cutting through of the types. To avoid this result I propose to form the two uppermost carbon strips or sheets of somewhat heavier stock than the underlying sheets (see Figure 1). Another variation of the same thought is the arrangement of the sheets or strips of the multiple carbon roll in groups, the stock of each group being somewhat heavier than that of the subjacent group (see Figure 2). A still further variation of the thought is indicated in Figure 3. This contemplates a different weight of stock for each strip so that the resistance of each strip from the top down will diminish while the manifolding possibilities of the strips will increase as the force of the printing blow diminishes. A third source of carbon mutilation has been due to the treatment of the carbon strips with a uniform carbon compound. It has been found, however, that if the carbon coating is hard the carbon paper lasts longer, but the lower copies are faint and more or less illegible. On the other hand, if the carbon is soft, the manifolding qualities are improved but the printing impact necessary to extended manifolding quickly removes all of the carbon coating from the top sheets resulting in the waste of the practically unused lower carbons. To offset this condition I propose to vary the hardness of the carbons substantially in accordance with the force of the printing blow sustained by them. For instance, in Figure 4 there is indicated a series of webs in which the two uppermost sheets are of heavier stock as in Figure 1, and these sheets are treated with a harder carbon formula than the sheets of lighter stock located below. In Figure 5 the strips are formed as in Figure 2 of different weights of stock arranged in groups and in addition to this peculiarity each group is coated with carbon of a different degree of hardness, the uppermost group being the hardest and the lowermost group, the softest. The same thought is carried out in Figure 6 in which the carbon strips are graduated as to weight of stock and are coated with carbon of graduated degrees of hardness. Thus, the uppermost sheet has the greatest resistance, both as to weight of stock and hardness of carbon, while the lowermost sheet has the

least resistance in both respects. In Figure 7 is a further variation which consists in coating sheets, all of which are of the same weight of stock, with carbon of graduated degrees of hardness. In other words, while the stock of all sheets in Figure 7 is of the same weight, the carbon coating of each sheet is of a different degree of hardness, that of the top sheet being the hardest and that of the lowest sheet being the softest.

I have shown several variations of the different features of this invention for the reason that it is directed to the improvement of the conditions under which manifolding is done and as manifolding contemplates the securing of a wide variation in the number of copies produced, the inventive concept necessarily assumes somewhat different forms in correspondence with different manifolding conditions to be encountered.

It is thought that from the foregoing the structural embodiments of my invention will be clearly understood, but I wish to reserve the right to effect such variations thereof as may fall fairly within the scope of the protection prayed.

What I claim is:

1. The method of producing a carbon set which consists in treating paper sheets of different weights with carbonizing compositions of different degrees of hardness and superposing said sheets to form a set in which the sheets of greatest weight will be at the top and the least weight will be at the bottom and in which the carbon composition will be hardest at the top of the set and softest at the bottom thereof.

2. As an article of manufacture, a manifolding assembly of carbon sheets, the carbon coatings of which are of graduated relative hardness, whereby the transferring capacity of the sheets increases relatively through the assembly.

3. As an article of manufacture, a manifolding assembly of carbon sheets of graduated weights having carbon coatings of correspondingly graduated hardness whereby the relative durability of the sheets and the relative transferring capacity thereof is oppositely graduated through the assembly.

In testimony whereof I have affixed my signature.

LAURENCE E. LENTZ.