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METHOD OF MAKING RECORD CARDS FOR STATISTICAL MACHINES

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Fig. 1

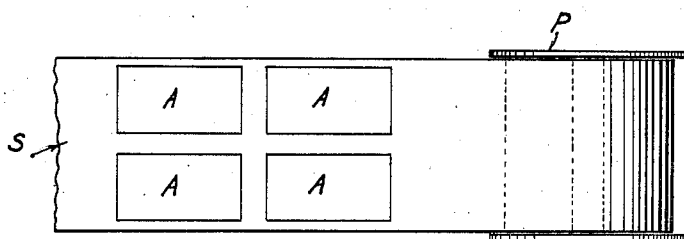


Fig. 2

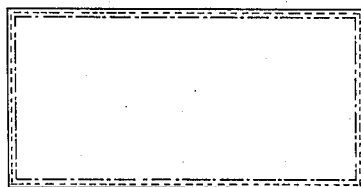


Fig. 3

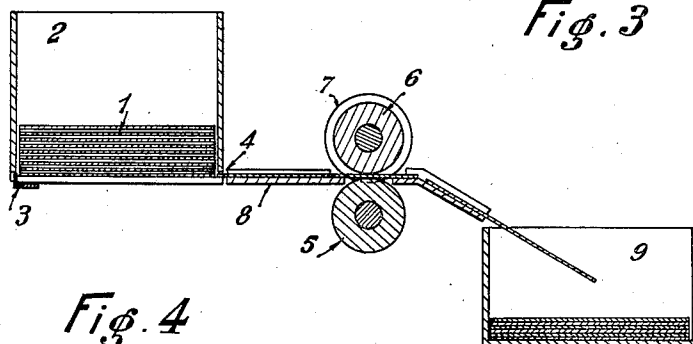
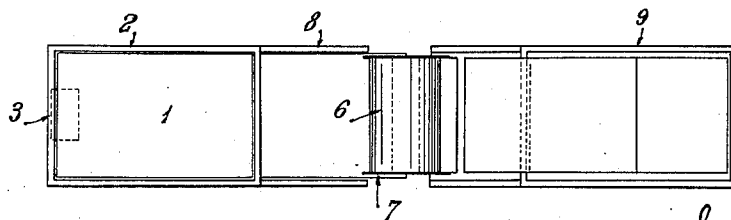


Fig. 4



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METHOD OF MAKING RECORD CARDS FOR
STATISTICAL MACHINES

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2 Claims. (Cl. 164-17)

This invention relates to the manufacture of record cards for controlling statistical machines. It is important that such cards should be cut to a definite size within fine limits, particularly as regards their height, since the machines are dependent for their correct operation on the controlling cards being of the correct dimensions.

Heretofore, it has been considered possible to satisfy the foregoing conditions by cutting the slips or cards in question to the final dimensions from reels of special paper or cardboard, the principal quality of which is regularity of thickness combined with the symmetry of composition relatively to the mean fiber.

Such a paper, once it has assumed its condition of equilibrium, does not in fact practically change in dimensions. The inventor has found, however, that the slips thus obtained do not constitute a perfect solution of the problem of the card or slip of exactly definite and strictly invariable dimensions.

In fact, the condition of equilibrium of paper in large reels from which are cut the cards or slips is not identical with the condition of equilibrium of the paper in bands or in pieces of small surface. During the manufacture of the paper or cardboard in large reels, internal stresses are developed which remain permanent as long as the paper remains in its initial form. At the moment of cutting, however, the paper is freed from the said stresses. However, due to a retardation phenomenon shown by experience, the paper or cardboard only gradually, and after a rather long length of time, assumes its condition of equilibrium in which the aforesaid internal stresses have disappeared.

In assuming this condition of equilibrium, it varies in its dimensions. It has thus been found that elongations or contractions are produced during a certain time in the slip, card, etc., cut out of the paper in reels. The paper or cardboard only becomes strictly invariable at the end of an appreciable time.

If, therefore, as is done at present, the slip or card is cut at once to the desired size, the said slip or card is no longer exactly of the same dimensions after some time.

In order to remedy this disadvantage and to obtain a card possessing the desired dimensions at the time it is put into service, and which will retain the exact dimensions during the course of the whole of its period of service, the invention provides the following method of manufacture:

1. The original reels are cut into pieces, the

dimensions of which are slightly greater than the dimensions of the desired card (about 3%), so as to obtain blanks.

2. These blanks are allowed to rest for sufficient time to enable the paper or cardboard to assume its condition of equilibrium, in consequence of the disappearance of the internal stresses to which it was subjected while it was in the form of a reel. In practice this period of rest should be of the order of several days.

3. The paper having ceased to make any elongation or contraction and having assumed its definite condition of equilibrium, the blanks or cards obtained are cut or trimmed so as to bring them to the exact size desired.

It is to be remarked that this last operation which merely corresponds to the removal of a very narrow strip along the sides of the card or slip, does not give rise to any variation in the internal stresses to which it is subjected and consequently no subsequent alteration in its dimensions.

Of course, if one of the dimensions of the card only requires approximate accuracy or if, for certain reasons, the operation of bringing the card cut from the reel into its condition of equilibrium does not produce any or only an absolutely negligible variation in one direction, the method provides the possibility of cutting the card along this direction immediately to the exact size and of retaining the margin of about 3% only in the other dimension.

After resting, trimming to the exact size will only be affected in this second dimension.

The first two operations may be carried out with the machines or equipment known in the industry of cards and slips.

The latter operation of bringing to the exact dimensions after resting will preferably be effected by means of a special machine which likewise forms the subject of the invention.

A further object of the invention is constituted by cards, slips and other articles produced by the method according to the invention.

The latter will be better understood by means of the accompanying drawing:

Figures 1 and 2 illustrate generally the form of the cards in carrying out the method according to the invention.

In Figures 3 and 4 there is shown diagrammatically a machine which serves according to the invention for bringing the blanks, after resting, to their exact dimension.

In Figure 1 will be seen the paper or cardboard of appropriate quality being unwound from the

reel P, on which it was wound, to form a wide band S. Cards or slips A, of dimensions slightly greater (for example 3%) than the desired dimensions are cut out of this wide band. The cards A are then left for some days. Due to the stresses which are produced in the paper, their dimensions are modified and for example are reduced to the dimensions indicated in dotted lines in Fig. 2. The latter are still slightly greater than the exact final dimensions which the finished card or slip is to possess.

The latter is then cut out according to the chain lines shown and there is thus obtained a slip of the exact dimensions which is no longer capable of any deformation.

The machine substantially comprises two gauge rollers 5, 6, between which the slips or cards are passed from a magazine 2 on a table 8, the slips after treatment, falling into a magazine 9, where they are stored.

The blanks 1 to be cut (in the direction of the length for example) are stored in a pack in the magazine 2, similar to that of statistical machines, from which they are extracted one by one by action of a reciprocatory pusher blade 3 which drives the lower blank of the pack through the slit 4. When the blank in its movement of translation, enters between the rollers 5, 6, the latter which are given a rotary movement, drive it along. The pusher 3 returns to the rear to engage the next blank and the cycle of operations is repeated. The process need not be described further in detail, since the aforesaid members are commonly employed in statistical machines.

The roller 5 has exactly the width corresponding to the width of the desired card. The roller 6 has the same width but in addition it carries two circular flanges 7 which fit exactly on the faces of the roller 5 on which they project slightly. It follows that the blank, at the moment at which it passes between the rollers 5 and 6,

is sheared by the intersection of the edges of the roller 5 with the edges of the flanges 7. At the moment of ejection there will be obtained a card of the desired width and two strips of paper or shavings, the width of which represents the excess of the dimensions of the blank over the size of the card.

A like operation will be effected on the other dimension of the card if necessary.

There will finally be obtained cards to an exact gauge and these cards will have been cut out in the absence of any internal stress.

It will be understood that the invention is not limited to cards or slips of any particular kind of paper, cardboard or like material. The method according to the invention, without departing from the invention, may be applied to the manufacture to exact final dimensions, of thin articles cut or stamped out of plates or sheets of a material of a nature such that for a certain time after this cutting from the plate of sheet, it undergoes modifications of dimensions caused by the assumption of a fresh condition of equilibrium.

It should likewise be understood that the method according to the invention is applicable to the production of articles of absolutely any desired shape and outline.

What I claim is:

1. A method of making record cards for statistical machines comprising in combination, cutting out of a reel of paper, cardboard or like material, blanks having a dimension slightly greater than the exact dimensions required for the finished cards or slips; storing said blanks for a period of time until the material of the blanks has assumed its final equilibrium of dimensions and then trimming the blanks to the exact dimension required.

2. A record card for statistical machines made by the method according to claim 1.

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