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MANIFOLDING

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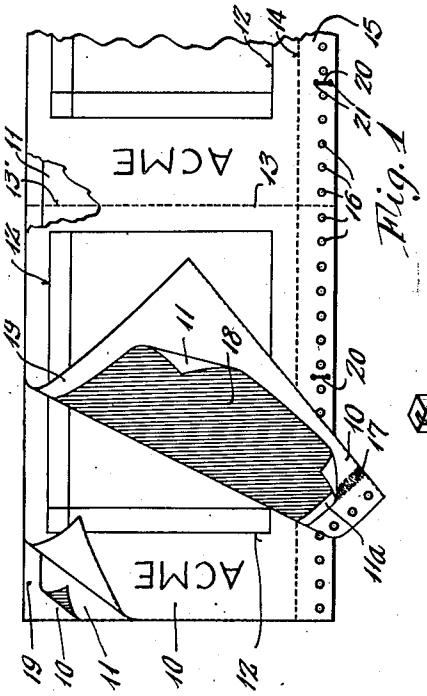


Fig. 1

Fig. 2

Fig. 3

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MANIFOLDING

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This invention relates to manifolding material and to methods for making the same; and, more particularly to collated sets of record strips or sheets, and transfer or carbon strips or sheets, and the methods by which they are assembled and connected.

Heretofore it has been proposed to manufacture manifolding sets by the interleaving of continuous stransfer or carbon strips with continuous record strips and to secure the same together along one margin. The continuous superposed and attached strips were then collected by zigzag folding the same, or form lengths were chopped from the end thereof to provide individual sets of sheets. Sets of the type with which my invention is concerned are usually made using record strips which have superposed longitudinal weakening lines defining one margin, and the strips are all secured together and to the carbons within the space of these margins. This marginal area of the strip or set is generally known as the stub or binding margin.

In use, after a set has been fed through and written upon by a machine designed to handle and write the same, the written set is normally separated into sheets having a length of one form, usually by tearing the same on transverse weakening lines. Such an individual set whether originally produced as such or separated from continuous strips, is designed for simultaneous removal of all transfer sheets from the record sheets by merely tearing the record sheets along their longitudinal lines of weakening, the stub and unweakened carbon sheets being withdrawable therefrom as a unit. Normally the free edges of the record sheets extend beyond the carbon sheets to permit grasping of all record sheets and simultaneous separation thereof from the carbons.

The stub or binding margin of the set is frequently punched to provide openings for engagement with complimentary feed devices either for registering and feeding the strips during manufacture, or for suitably feeding a continuous set during subsequent use, or both.

An object of the invention is to provide carbon-interleaved forms, either individual or continuous, which will be so constructed that their manufacture from record strips and carbon strips may be conducted without the necessity for processing the carbon strips to punch or perforate the same and to provide a suitable method for thus constructing such manifolding sets.

This is accomplished according to the present invention by supplying to the collating machine

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rolls of record strips and rolls of carbon strips attaching each carbon strip to an adjacent record strip bringing all the record strips into registration and securing them thus by means of the binding margins and then simultaneously transversely perforating all the strips between forms. Thus, according to the present invention carbon strips which are merely cut to widths and wound to form rolls may be used in making the manifolding sets, and the operation of transversely perforating the record strips prior to collation is obviated.

The feature of the present invention of attaching each carbon strip to an adjacent record strip before it is collated and stapled permits the saving of carbon sheet material where the binding and feeding margins of the record strips are wide, since it is not necessary as was the case heretofore to catch the edges of the carbon strip by the legs of the staple. Where the binding and feeding margins of the record strips are narrow the transversely disposed staples usually used will penetrate the carbon strip but this is merely incidental for the carbon is already secured to the binding margin of its associated record strip.

Other features and advantages will hereinafter appear.

In the drawing:

Figure 1 is a plan of a continuous manifolding set in accordance with my invention, certain elements thereof being broken away or folded back to illustrate the construction.

Fig. 2 is a perspective view illustrating the manner in which the records and carbons are adhered, and the records assembled, registered, stapled and divided.

Fig. 3 is a diagrammatic elevation showing record strips and carbon strips being led from individual supply rolls, adhered, and guided together in the collating machine.

The manifolding sets of my invention are preferably made up of continuous alternating record strips 10 and carbon strips 11. When prepared for use in continuous form each record strip 10 has a succession of printed forms 12 bounded by parallel transverse weakening lines 13. Corresponding weakening lines 13' in the carbon strips 11 register with the weakening lines 13 so that an individual manifolding set may be separated from the continuous strip set when desired by tearing along said lines. Each record strip also has a longitudinal line of weakening 14 adjacent one edge and defining a binding margin 15 cooperating with the margins 15 of other record strips to form the stub or binding margin of the

strips and ultimately of the sets. The margins 15 of the record strips are provided with rows of equally spaced holes 16 for registering and feeding purposes.

According to the present invention, each record strip 10 has attached thereto a carbon strip 11, save only the top or bottom record strip, depending upon which surfaces of the record strips have the carbon strips attached thereto. In the form shown, each carbon strip 11 is attached by an adhesive application 17 to the overlying record strip 10 with its carbon face 18 away from said record strip. In this case the bottom record strip 10 of the stack would fail to carry a carbon strip 11. If the carbon strips 11 were instead each connected to the underlying record strip 10 with its carbon face towards the record strip, the topmost record strip should then have no carbon strip attached. The longitudinally extending adhesive applications 17 are arranged so as to lie only in the margins 15 of strips 10 and occupy positions transversely inwardly of the holes 16. The carbon strips 11 are so superposed on the record strips that one edge of each carbon strip lies within the margin 15 of the record strips 10 but falls short of the row of holes 16. To facilitate carbon stripping, the carbon strip is preferably made narrower than the record strip so that its free lateral edge lies inwardly of the adjacent edge of the record strips leaving margin 19 thereof exposed beyond the carbon strips. Preferably the margin 11*a* on carbon strip 11 which overlaps the record strip margin 15 is clean, or free of carbon, and especially when it is desired to adhere the carbon strips to the underlying record strips.

The superposed strips are held together by means of staples or other suitable fasteners 20 passing through the margins 15. The staples 20 preferably are positioned transversely of the strips and are positioned approximately midway between adjacent holes 16 to avoid conflict therewith and with feeding and registering devices extending through said holes. Preferably the legs of the staples 20 extend through preformed holes 21 in the record strips.

According to the present invention, in order to reduce the cost of manufacture of the manifolding sets as above-described they are produced without the necessity of providing feed-control holes in the carbon strip, also without the necessity of providing the transverse form-delineating perforations 13' in the carbon strips until they are collated with the record strips. Thus there is eliminated the necessity of prepunching the carbon strips and the latter may be furnished to the collating machine as manufactured or as it comes in rolls from the slitting and rewinding machine when the strip is made from a wide web.

Likewise, the record strip being without transverse perforations is supplied to the collating machine in roll form.

The manner of assembling the manifolding set of my invention is illustrated in Figs. 2 and 3 wherein the record strips 10 are withdrawn from continuous supplies such as rolls 30 and the carbon strips from rolls 31. Each record strip 10 (except the free top or bottom strip—the bottom strip in the form shown) may be guided laterally by rollers 32 and passes therefrom to a coating roller 34 which places thereon the adhesive application 17 which may be in the form of a continuous stripe. Each carbon strip 11 is then pressed into engagement with the overlying record strip 10 as the two pass between a pair of presser rolls 36 which assist in adhering the strips 10 and 11 together. The adhered strips pass over guides 38 and converge into adjacent superposed relation to be brought into registration and receive further operations.

In the form shown the strips pass under a common guide 40 upon a collating table 42. The strips are fed across the collating table by the intermittent motion of a registering and feeding head 44 connected by link 46 with a suitable drive so arranged that it will withdraw the pins 48 from the openings 16, retract the head 44 a distance equal to the length of one form 12, reengage the pins 48 with other openings 16 thereby urging the forms into exact registry, and feed the strips forward simultaneously one form's length, and continuously repeat this cycle of motions.

Adjacent one edge of the table 42 is positioned a fastener applying device, preferably a stapling head 50 which applies simultaneously a pair of staples 20 to each set of forms in turn. The stapling head 50 is preferably actuated by the same driving mechanism as the link 46 and its operation is so timed as to precede the withdrawal of the pins 48 and return movement of the link 46 and thus engage the strips while they are stationary and in registration.

The staples 20 are driven through the marginal portions 15 of the superposed record strips. Depending upon the relative size and disposition of the staples and the width of margins 15, a portion or all of staples 20 may pass through the adhered carbon margins 11*a* as well as through the margins 15 of record sheets 10. With the type of staple disposition shown, the inner leg of each staple 20 will often pierce the records and the carbons when the margins 15 are narrow, but with wider margins 15 as shown in Fig. 1 the staples 20 will entirely avoid the carbon margins 11*a*.

As shown in Fig. 2, preformed openings 21 are formed in the record strips for receiving the staples 20 which are slightly larger than the diameter of the legs of the staples 20, so as to prevent the record strips 10 from being too tightly clamped by the staples 20 and permit the slight relative movement necessary to prevent buckling when the form lengths are being zigzag folded to form a pile.

The last station on the collating table 42 is occupied by a perforating head 51 which partially cuts the strips tranversely between forms to provide transverse weakening lines 13, 13' passing simultaneously through all of the record elements 10 and carbon elements 11 of the set. The perforating head 51 is driven by the same driving mechanism as the link 46 and is preferably timed to transversely weaken the strips at the time that the operation of the stapling head 50 occurs. It will be readily appreciated that in cases where desired, individual forms rather than a continuous set may be produced by substituting a chopping device for the perforating head 51.

As each section of the continuous manifold set is completed by stapling and cross perforating, the same passes from the edge of the collating table 42 and falls to the top of a zigzag pile 52 in which form the continuous sets are collected.

While the drawing illustrates the preferred form in which the adhesive stripes are applied to the record strips, it will be appreciated that the stripes of adhesive material 17 may be placed

upon either the record strips or carbon strips as convenient.

Thus it can be seen that I have invented an improved manifold set and method for making the same wherein each carbon sheet or strip is adhered to one record sheet or strip within the binding margin thereof, the record sheets or strips then being bound together by a fastener applying device operating in coordination with the registering and feeding of said record strips.

Likewise, important advantages result from the above-described method of collating and assembling record and carbon strips to form a continuous pack. Paramount among these is the fact that carbon strip material 11 can be taken directly in roll form 31 as it comes from the manufacturer or slitter and can be fed into collated relationship with record strips 10 without the necessity for preprocessing of the carbon or the provision of any feeding or registering openings therein, the feeding of the carbon being fully controlled by the adhered relation of strips 11 to the record strips 10. Furthermore, the final simultaneous cross perforation of all superposed strips as by perforator 51 eliminates the necessity of cross perforating of the record strips 10.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. A continuous snap-out manifolding set comprising a pile of record strips and interleaved transfer strips, each of said record strips having a longitudinally extending weakening line defining a margin thereof, and at least one thereof having a series of forms printed thereon to read or to be filled in to read on lines running transversely of the strip, said transfer strips each being adhered near one edge to one only of said record strips and solely in the margin thereof, and having its opposite edge spaced inwardly from the opposite edge of the record strips, said

record strip margins having aligned openings therein; and staples passing freely through said openings and binding said record strips loosely together, said pile having transverse weakened lines at form length intervals and being folded zigzag fashion on said weakening lines for convenient storage.

2. A continuous manifolding set comprising a pile of record strips each having a longitudinally extending weakening line defining a binding margin; transfer strips interleaved with said record strips, said transfer strips each having its edge inset from those edges of the adjacent record strips which are nearest said lines and being adhered to one only of said record strips solely within the binding margin thereof, said binding margins having preformed openings therein in the free area beyond said transfer strip edges, each strip having a pair arranged crosswise of the strip, and staples passing freely through said openings, extending crosswise of the strip, and connecting together said binding margins, said pile having transverse weakened lines at form length intervals and being zigzag folded on said weakening lines for convenient storage.

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