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2,539,358

DECOLLATOR

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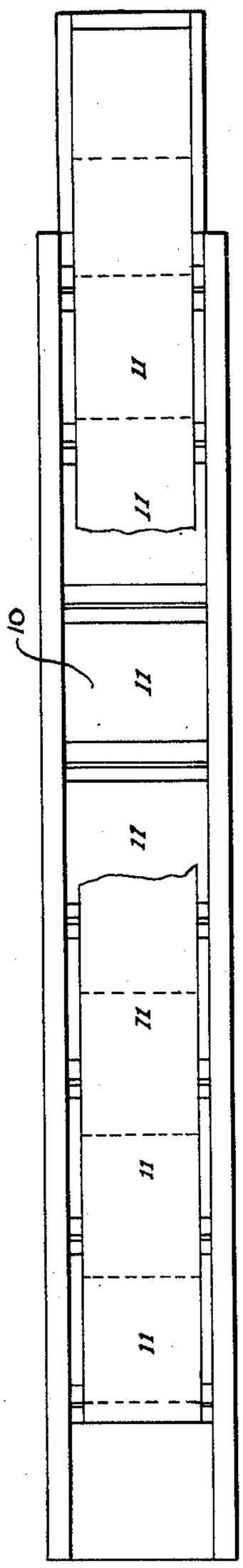

Fig. 1

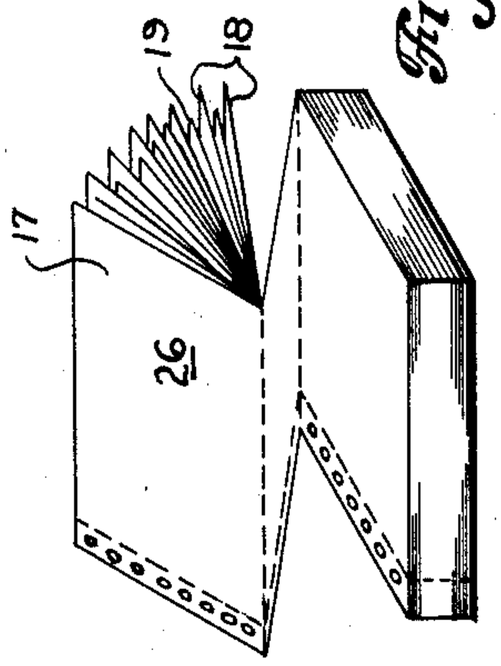

Fig. 3

Fig. 2

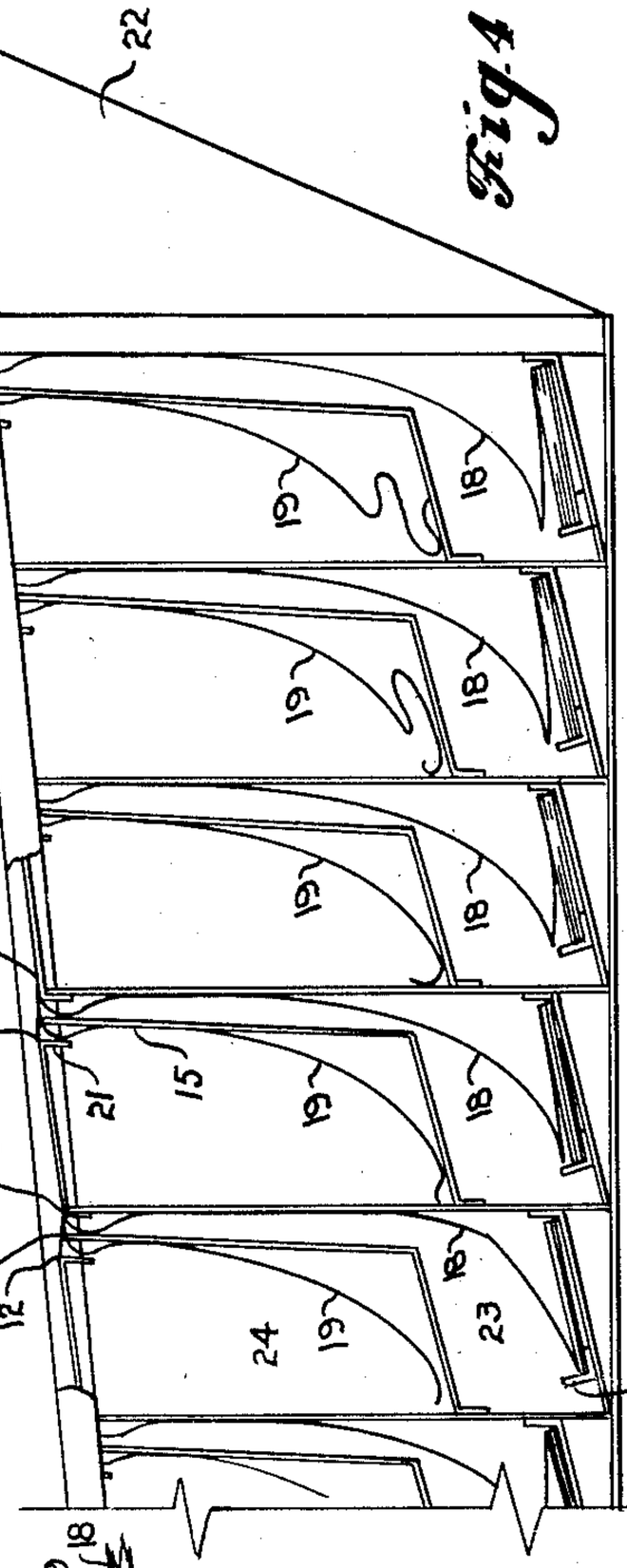

Fig. 4

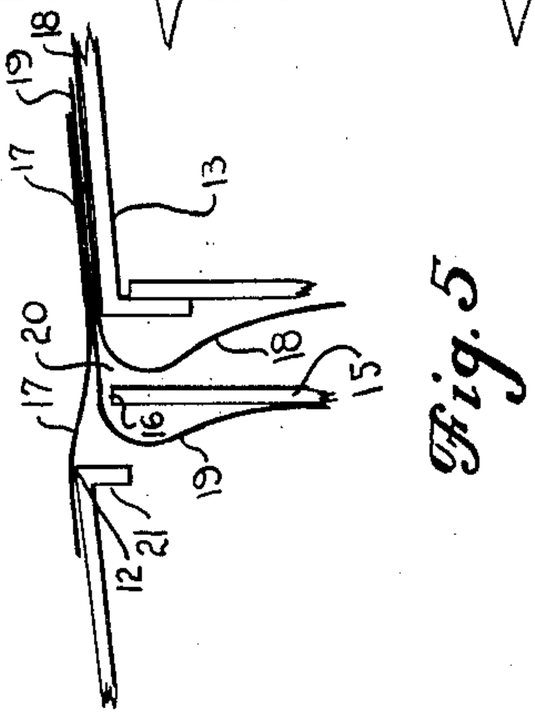

Fig. 5

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DECOLLATOR

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4 Claims. (Cl. 271—2.1)

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This invention relates to a sorting apparatus for manifolding strips of connected forms, and relates particularly to a device for progressively separating interleaved continuous strips of record paper and carbon transfer paper, and the rearrangement of the separated strips into individual packets.

In modern business offices, strips of continuous superposed connected forms in series with interleaving strips of carbon material for production of manifold copies of written material has become quite extensive and common as a time-saving expedient. Many devices have been proposed for mechanically separating the manifold copies from one another and removing the carbon material. Because these devices have generally been unsuccessful for various reasons, the old practice still prevails to collectively divide the strips transversely into successive sets of forms and interleaving transfer carbons which must be subsequently manually separated and sorted according to destination of the several copies. Another method commonly used is to employ several people working as a team to separate continuous series connected forms after they have been passed through a business machine. Much time of assembling and inserting the forms in the business machine is saved by the use of such continuous series connected forms, and therefore, the team method has been preferred rather than to separate the series into individual sets prior to inscribing them in the business machine.

The present invention provides for high speed mechanical separation of the inscribed strips of connected forms and the interleaving transfer carbons, thus achieving a great saving in time and affording increased efficiency. This apparatus enables consecutive copies of different sets of forms to be kept together by refolding the separated strips without dividing them into independent sets. Thus, in a typical business system the various copies which are sent to the warehouse, the sales department, the accounting department, and the customer's copy may be kept in consecutive order in a single step and would be assured against loss or misplacement. Furthermore, much time is saved in inscribing and separating the copies for the various departments.

An object of this invention is to provide means for quickly and easily separating the original inscribed continuous business form and one or more carbon copies thereof into separate packages, and simultaneously removing the carbon transfer material from the business forms.

Another object of this invention is to provide a

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decollator having table section supports positioned relative to one another to produce a positive separating action between a carbon copy and the carbon transfer material producing the copy.

A still further object of this invention is to provide a decollator operable by gravity feed to separate one or more copies and the carbon transfer material from the original inscribed business form.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a top view of the preferred embodiment of this invention;

Figure 2 is a perspective view of a portion of the decollator device illustrating the relationship of collecting bins below the separating table;

Figure 3 is an illustration of a typical continuous strip business form having several duplicate copies interleaved with continuous strips of carbon transfer material;

Figure 4 is a side view of the decollator with a portion of the table side railing broken away to illustrate the relationship of the table sections and separator devices; and

Figure 5 is an enlarged diagrammatic view of the forward and rearward portions of two table sections and the cooperating separator device therebetween.

As illustrated in the drawing, the preferred embodiment of this invention comprises a longitudinal table area **10**. The table area is wide enough to accommodate the usual width of the business form intended to be separated, and its length will be determined by the maximum number of copies to be separated.

In the Figure 4, and the enlarged diagrammatic illustration in the Figure 5, a feature is illustrated which has materially affected the successful operation of this decollator. The stack of copies as they originally come from a business machine is indicated by the reference character **26**. Three strips; an original **17**; a sheet of carbon transfer material **19**; and a carbon copy **18**, are illustrated in Figure 5 by heavy lines as their side edges to set forth the separating action of the device. Those familiar with the characteristics of carbon transfer material will realize that the carbon material tends to adhere rather tenaciously to the copy produced. Furthermore, the carbon transfer material has a tendency to deposit a tacky film and build up a static electrical charge when it moves across the face of a supporting member. In manifolding apparatus heretofore employed,

the carbon transfer material is permitted to travel in contact with support surfaces, and therefore, the separating process is continuously interrupted by the carbon transfer material clinging to the supporting surfaces, and resisting separation from the paper strips. Thus, the separating process becomes snarled and the operation of these machines must be stopped until the copies and the carbon transfer material are untangled and rethreaded into the machine.

In the decollator of this invention the table area 10 is divided into a plurality of table sections 11. It is possible to provide one continuous table area 10 and provide slots in the table area, but it has been found to be more economical and practical to produce the individual table sections 11. Each table section 11 has a forward edge 12 and a rearward portion 13. Lightweight sheet metal has been found to be quite practical for the table sections 11, but polished wood or plastic sections may be entirely feasible.

Each of the table sections 11 is mounted in a frame holder 14 with the forward edges 12 defining a plane. The rearward portions 13 of the table sections 11 are positioned below the plane defined by the forward edges 12. In other words, considering the table area 10 by itself without regard to is sloped position as illustrated in the Figure 4, each of the table sections 11 has a forward edge 12 positioned above the rearward portion 13 thereof.

The rearward portion 13 of one section and the forward edge 12 of the next following section are separated to provide a slot area therebetween, as illustrated in the Figures 4 and 5. This slot area is defined by the low rearward portion 13 and the high forward edge 12 of two successive table sections 11. This slot area is especially well shown in the Figure 5. A separator device 15 in the form of a thin sheet projects upwardly in the slot thus defined and has an upper edge 16 extending just up to or a little below the extended surface of the portion 13. That is, the upper edge 16 does not extend higher than the top surface of the rearward portion 13.

In the Figure 5, the improved separating action of this invention is illustrated. Only an original strip 17 and one carbon strip 18 are illustrated for the purpose of setting forth the improved separating action. It is to be understood that each slot area between the table sections 11 is adapted to separate one carbon copy and one transfer strip. Additional strips of paper and carbon transfer material on top of the strip 17 would make no difference to the separating action illustrated in the Figure 5. Thus, regardless of the number of manifolded strips to be separated, each slot area removes just one copy and one carbon transfer strip and passes the remaining strips on to the next following slot area. Therefore, the length of the table area 10 will be determined by the number of copies to be separated, because one slot will be required for each copy.

In Figure 5 the positive mechanical separating action takes place in the area indicated by the reference character 20. Positive separation of the bottom carbon copy 18 and the carbon transfer strip 19 which produced the copy being removed is assured by this invention. The carbon copy 18, as illustrated in the Figure 5, is threaded into the area between the end of the portion 13 and the separator device 15. The copy 18 is the usual crisp paper employed in business forms, and therefore, will readily follow the curved path illustrated without undue tendency to buckle and stick. This type of paper is not even unduly troubled with static electricity.

The carbon transfer strip 19, as will be seen in this Figure 5, is threaded over the upper edge 16 of the separator device 15 and is then allowed to fall into the slot between the edge 12 and the separator device 15. Thus, the carbon transfer strip 19 is held on a substantially straight path as it moves past the end of the portion 13 because the upper edge 16 is substantially as high as the end of the portion 13. However, the copy 18 is forced to move downwardly into the slot as illustrated, and therefore, will pull away from the carbon transfer strip 19. This positive separation of the carbon transfer strip 19 and the carbon copy produced thereby is desirable because the carbon transfer material normally employed is of the "one time" variety and is very thin and flimsy. This carbon transfer strip has a tendency to stick to the carbon copy produced when the weather is warm or when impressions have been made over a considerable surface area.

A depending flange 21 is illustrated extending downwardly from the forward edge 12. The flange 21 is primarily for the purpose of avoiding a sharp knife edge on the table surface. It helps also to direct the carbon transfer strip downwardly when normal separation takes place by gravity between the carbon transfer strip 19 and the strip 17 passing on to the next slot area. The carbon transfer 19 is quite susceptible to static electricity and also to sticking action as previously described. Therefore, the transfer strip 19 will not always break away from the strip 17 by gravity as illustrated in the Figure 5. In the event that the transfer strip 19 tends to cling to the strip 17, the forward edge 12 will prevent the transfer strip 19 from traveling on with the strip 17. In other words, the edge 12 with the flange 21 acts as a scraping edge to positively remove the transfer strip 19 in the event that the strip 19 tends to cling to the bottom surface of the strip 17. Thus, this invention overcomes the various deficiencies so common to prior art devices, such for example as passing carbon transfer strips over flat surfaces which may develop a static electricity charge and dirty carbon-gummed surfaces which tend to cause clinging and buckling of the carbon material, and also provides positive separation of each carbon copy into a separate pack. This invention provides positive support for the carbon transfer strips at all times, but prevents the carbon strip from contacting the supporting surface. The copy 18 always separates the carbon transfer strip 19 from the table sections 11. Furthermore, no positive drive is required to pull the material through this decollator, because the surfaces have no tendency to cause the strips to cling thereto.

Although the separating action described is decidedly important, many other features of this improved decollator add greatly to the proper separating function. In the Figure 4 a paper stand 22 is illustrated to hold a folded strip of the business form as it comes from the inscribing machine. This table 22 supports the package slightly above the front of the table area 10. Further, as illustrated, the entire table area 10 is provided at a slightly downward slope. Thus, the various carbon copies 18 may be threaded into the slots between the rearward portion 13 and the separator device 15 as illustrated, and the carbon transfer strips 19 may be threaded into the slot between the forward edge 12 and the separator device 15. The bottom carbon copy 18

is placed in the first such slot at the forward end of the table 10 and each successive carbon copy is threaded into the next following slot. Likewise, the carbon transfer strips 19 are threaded as illustrated. Of course, each carbon transfer strip 19 is threaded into the slot on the opposite side of the separator device from the carbon copy 18 which it has produced. After all of the carbon copies and carbon transfer strips have been threaded substantially as illustrated in the Figure 4, the operator may stand back and the force of gravity acting upon the weight of the strips lying on the table area 10 will cause the strips to slide down the sloping table area 10 and feed by itself without the use of any type of mechanical drive.

This decollator is provided with a plurality of copy bins 23 and carbon copy transfer paper bins 24. The bins may be provided with adjustable stop members 25 as illustrated in the Figure 2 in order to adjust the area to the exact length of each section of the copies between the fold in the strips. Therefore, the copies will fold themselves in the bins 23 as illustrated.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. A decollator, comprising a rearwardly sloping longitudinal table area, said table area having a plurality of spaced slots extending transversely of the table area, the rearward edge of each slot being higher than the forward edge of the slot, and a separator device projecting upwardly into each slot, said separator devices each comprising a plate member having a thin upper edge, said plate member extending in a vertical direction with the upper edge extending substantially up to the projected surface of the forward edge of the slot into which it projects, said separator devices dividing the space under the table into storage spaces into which separated carbon copies and carbon paper may be collected.

2. A decollator, comprising a table having at least a forward table section and a rearward table section, each table section having a forward end portion and a rearward end portion, the forward end portion of the rearward table section lying a distance behind and above the rearward end portion of the forward table section, and a separator device comprising a plate member having an upper edge projecting upwardly between the table sections to a height substantially as high as the projected surface of the forward table section.

3. A decollator comprising, a longitudinal table area composed of a series of table sections, each table section having a forward edge and a rearward edge with a table area therebetween, the forward edges of the sections in the series defining a plane, the table area of each section depending downwardly and rearwardly in an angular direction from the plane defined by the front edges, said table sections in the series being spaced to provide a slot area between the rearward edge of one table section and the forward edge of the following table section, and separator plate means for each said slot, said plate means having a thin edge portion projecting upwardly in a vertical direction into said slot area with the top edge thereof extending substantially as high as the projected surface of the table section immediately forward of the slot.

4. A decollator comprising, a longitudinal table area composed of a series of table sections, each table section having a forward edge and a rearward edge with a table area therebetween, the forward edges of the sections in the series defining a rearwardly sloping plane, the table area of each section depending downwardly and rearwardly in an angular direction from the plane defined by the front edges, said table sections in the series being spaced to provide a slot area between the rearward edge of one table section and the forward edge of the following table section, and separator plate means for each said slot, said plate means having a thin edge portion projecting upwardly in a vertical direction into said slot area with the top edge thereof extending substantially as high as the projected surface of the table section immediately forward of the slot.

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