

# PATENT SPECIFICATION (11) 1 575 662

1 575 662

(21) Application No. 29408/77 (22) Filed 13 July 1977  
 (31) Convention Application No. 2 631 847  
 (32) Filed 15 July 1976 in  
 (33) Fed. Rep. of Germany (DE)  
 (44) Complete Specification published 24 Sept. 1980  
 (51) INT. CL. B65H 29/00  
 (52) Index at acceptance

B8R 671 AL

(19)



## (54) IMPROVEMENTS IN AND RELATING TO SHEET-TRANSPORT APPARATUS

(71) We, AGFA-GEVAERT AKTIEN-GESELLSCHAFT, a body corporate organised according to the laws of the Federal Republic of Germany, of Leverkusen, 5 Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to sheet-transport apparatus and especially to such apparatus having means for discharging electrostatic charge on sheet material transported by the apparatus. 15 It has previously been proposed to position a metal discharge device in the region of the outlet path of transported sheets. Such discharge devices, as are used in 20 microfilm throughout photographic apparatus (that is to say, apparatus by means of which originals, are photographed onto microfilm, the originals being fed successively into the apparatus and being microfilmed as they move through it), are attached by means of adjusting screws in a fixed position determined by the manufacturer at the outlet of the sheet-transport apparatus. The devices are precisely positioned by the manufacturer in such a 25 manner that they function most effectively when paper of the type most common used is involved.

The paper material of the originals to be 30 microfilmed may, however, by of very different kinds, for example, the paper may be ordinary writing paper, very thin airmail paper or cheques, with the result that while it passes through the sheet-transport apparatus, it becomes heavily electrostatically charged and also leaves the sheet-transport apparatus in a bent state, the 35 seriousness of these disadvantages in both cases depending on the kind and strength of the paper. As a result, in particular, in the case of the paper that is very different from average, it cannot be guaranteed that the paper is discharged as well as possible. In addition, the discharge device arranged in the region of the outlet path of the sheet has a different effect on the further substantially free path of movement of the sheets from the sheet outlet to a delivery compartment arranged below the sheet outlet, depending on the extent to which the sheet delivered is bent, and this means that it is difficult, especially in the case of microfilm throughout photographic apparatus, in which the sheets are transported very quickly, for sheets to be deposited evenly and regularly, as some are more bent than others. 50

The invention provides sheet-transport apparatus having at its outlet, means for discharging electrostatic charge on the sheet material transported by the apparatus, the discharge means comprising a discharge element so movable relative to the outlet that it can be inserted to a variable extent into the outlet path of the sheets and wherein there is provided an external control co-operating with the discharge element for positioning the element. 55

With the arrangement of the invention, the operator can select the best position of the discharge element in each case for the type of paper in question. Thus, it is possible to achieve consistently good electric discharge, irrespective of the nature of the sheets, and to ensure, in addition, that the sheets are deposited in an ordered manner, irrespective of the extent to which the sheets delivered are bent. 60

The discharge element is advantageously so mounted as to be pivotal relative to the apparatus as a whole, and, preferably, the external control is in the form of a pivotal lever projecting from the apparatus on one side of the discharge element, the lever being pivotal to pivot the discharge element. 65

In order that the discharge element, which is a wearable component, can be exchanged quickly, the discharge element is advantageously pivotally mounted by means of a holder to which the discharge element is detachably secured, the holder being pivotally 70

75

80

85

90

95

mounted in the apparatus. In particular, it is possible for the discharge element to be secured in an especially simple manner to the holder by means of keyhole connections.

5 The discharge element may be an earthed metal brush or an earthed metal reel.

Two forms of sheet-transport apparatus constructed in accordance with the invention will now be described with reference to the 10 accompanying drawings, in which:

Figure 1 shows semi-schematically a section through a portion of a first form of the apparatus of the invention;

15 Figure 2 shows semi-schematically a view of a detail of the apparatus shown in Figure 1; and

Figure 3 shows semi-schematically a further form of sheet transport apparatus.

20 Referring to the accompanying drawings and initially to Figure 1 transport belts 8 are tensioned over reels 2, 3 and 4, which reels are rotatably mounted by means of axles 5, 6, 7, fixed in the apparatus, and these belts are driven by means of a drive device (not shown) in the direction of movement A. A guide plate 9 is arranged below the reel 3. A holder 10 is pivotally mounted about an axle 11. An earthed metal discharge brush 12 is hooked by means of keyhole-type recesses 12a to key bolts 10a, which bolts are secured on the holder 10. A pivotal lever 13 is secured to the side of the holder 10. A delivery compartment 14 is provided for sheets of paper 15.

25 The sheets of paper 15 forwarded through the apparatus by the driven transport belt 8 become electrostatically charged during transportation as a result of friction and, in addition, in the region of curved sections 30 of the path, for example, in the region of the reel 2, themselves become more or less permanently bent, so that they leave the transport device at the outlet path, that is, in the region of the guide plate 9 and of the reel 3, electrostatically charged and also 35 curved. In order to maintain the earthed discharge brush 12 in each case in the optimal position for the type of paper used, the operator can introduce the discharge brush 12 to a greater or lesser extent into the path of movement of the sheet by pivoting the lever 13 in the direction B—C of the arrows. In this manner it is possible for the operator to control the movement 40 of the sheet through the air in such a manner that the sheet to be deposited is guided safely into the delivery position.

45 Figure 3 shows a further embodiment of a discharge device, in which instead of the discharge brush 12, a metal discharge reel 22 is provided, mounted on two arms 10b of the pivotal earthed holder 10.

50

55

60

65

70

75

80

85

90

95

100

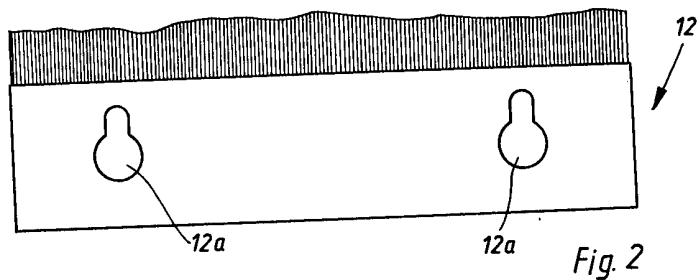
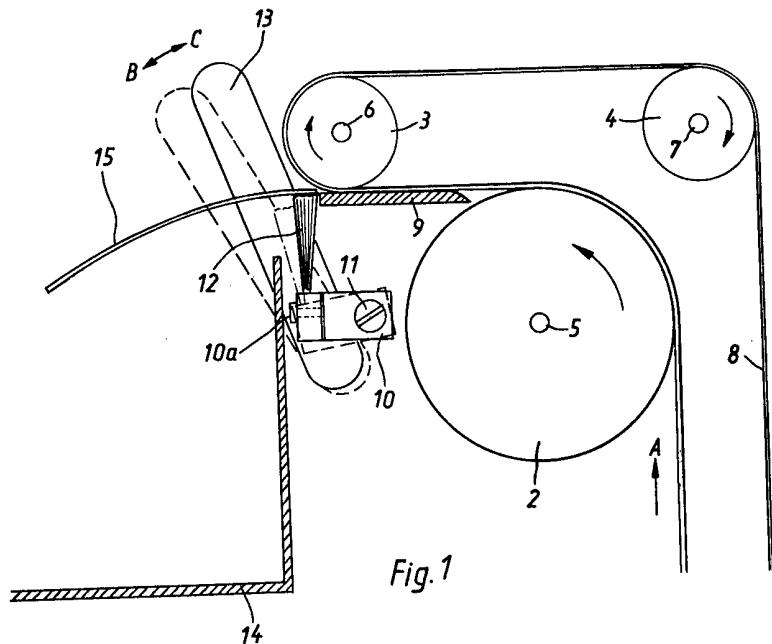
105

WHAT WE CLAIM IS:—

1. Sheet-transport apparatus having, at its outlet, means for discharging electrostatic charge on sheet material transported by the apparatus, the discharging means comprising a discharge element so movable relative to the outlet that it can be inserted to a variable extent into the outlet path of the sheets and wherein there is provided an external control co-operating with the discharge element for positioning the element.
2. Sheet-transport apparatus as claimed in claim 1, wherein the discharge element is so mounted as to be pivotal relative to the apparatus as a whole.
3. Sheet-transport apparatus as claimed in claim 2, wherein the external control is in the form of a pivotal lever projecting from the apparatus on one side of the discharge element, the lever being pivotal to pivot the discharge element.
4. Sheet-transport apparatus as claimed in claim 2 or claim 3, wherein the discharge element is pivotally mounted by means of a holder to which the discharge element is detachably secured, the holder being pivotally mounted in the apparatus.
5. Sheet-transport apparatus as claimed in claim 4, wherein the discharge element is secured to the holder by means of key-hole connections.
6. Sheet-transport apparatus as claimed in any one of claims 1 to 5, wherein the discharge element is in the form of an earthed metal brush.
7. Sheet-transport apparatus as claimed in any one of claims 1 to 5, wherein the discharge element is in the form of an earthed metal reel.
8. Sheet transport apparatus substantially as hereinbefore described with reference to, and as shown in, Figures 1 and 2 or Figure 3 of the accompanying drawings.

ABEL & IMRAY,  
Chartered Patent Agents,  
303—306 High Holborn,  
Northumberland House,  
London WC1V 7LH.

1575662 COMPLETE SPECIFICATION  
2 SHEETS This drawing is a reproduction of  
the Original on a reduced scale  
Sheet 1



1575662

1575662 COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheet 2

Fig. 3

