

1 575 662

- (21) Application No. 29408/77 (22) Filed 13 July 1977 (19)  
 (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.<sup>3</sup> B65H 29/00  
 (52) Index at acceptance  
 B8R 671 AL



(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  
 10 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  
 15 apparatus.

It has previously been proposed to posi-  
 tion 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 appa-  
 ratus (that is to say, apparatus by means  
 of which originals, are photographed onto  
 microfilm, the originals being fed succes-  
 sively into the apparatus and being micro-  
 25 filmed as they move through it), are  
 attached by means of adjusting screws in a  
 fixed position determined by the manu-  
 facturer at the outlet of the sheet-transport  
 apparatus. The devices are precisely posi-  
 30 tioned by the manufacturer in such a  
 manner that they function most effectively  
 when paper of the type most common used  
 is involved.

The paper material of the originals to be  
 35 microfilmed may, however, be 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  
 40 apparatus, it becomes heavily electrostatic-  
 ally charged and also leaves the sheet-  
 transport apparatus in a bent state, the  
 seriousness of these disadvantages in both  
 cases depending on the kind and strength of  
 45 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 50  
 has a different effect on the further substan-  
 tially free path of movement of the sheets  
 from the sheet outlet to a delivery com-  
 partment arranged below the sheet outlet,  
 depending on the extent to which the sheet 55  
 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 60  
 and regularly, as some are more bent than  
 others.

The invention provides sheet-transport  
 apparatus having at its outlet, means for  
 discharging electrostatic charge on the sheet 65  
 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 70  
 there is provided an external control co-  
 operating with the discharge element for  
 positioning the element.

With the arrangement of the invention,  
 the operator can select the best position of 75  
 the discharge element in each case for the  
 type of paper in question. Thus, it is pos-  
 sible to achieve consistently good electric  
 discharge, irrespective of the nature of the  
 sheets, and to ensure, in addition, that the 80  
 sheets are deposited in an ordered manner,  
 irrespective of the extent to which the sheets  
 delivered are bent.

The discharge element is advantageously  
 so mounted as to be pivotal relative to the 85  
 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. 90

In order that the discharge element, which  
 is a wearable component, can be exchanged  
 quickly, the discharge element is advan-  
 tageously pivotally mounted by means of a  
 holder to which the discharge element is de- 95  
 tachably secured, the holder being pivotally

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 accompanying drawings, in which:

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

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

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

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.

35 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 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 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 of the sheet through the air in such a manner that the sheet to be deposited is guided safely into the delivery position.

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.

#### 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 keyhole 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.

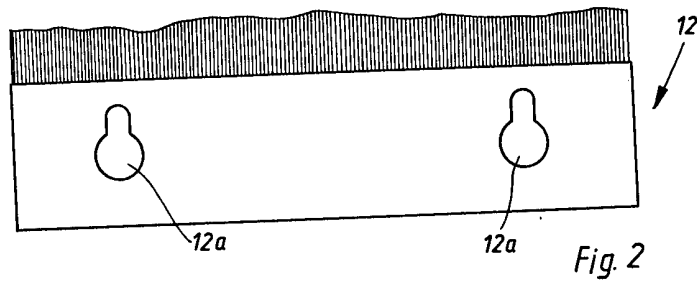
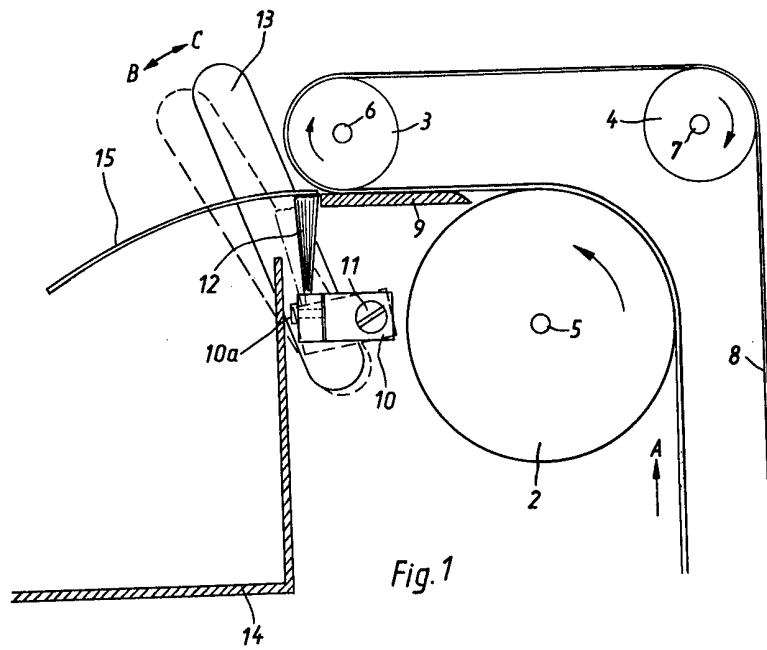
ABEL & IMRAY,  
Chartered Patent Agents,  
303—306 High Holborn,  
Northumberland House,  
London WC1V 7LH.

1575662

COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheet 1



1575662

COMPLETE SPECIFICATION

2 SHEETS

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

Fig. 3

