United States Patent [19]

Bendall et al.

[11] **3,907,280**

[45] **Sept. 23, 1975**

[54] **FLEXIBLE SHEET HANDLING DEVICE**

[75] Inventors: **Dennis M. Bendall,** Coleford; **William R. Harris,** Tutshill, near Chepstow; **Jeffrey Kew,** Upton St. Leonards; **Michael C. Sherborne,** Baydon, Marlborough; **John A. Jones,** Coleford, all of England

[73] Assignee: **Rank Xerox Ltd.,** London, England

[22] Filed: **Apr. 25, 1974**

[21] Appl. No.: **464,270**

Related U.S. Application Data

[62] Division of Ser. No. 371,453, June 19, 1973, abandoned.

[30] **Foreign Application Priority Data**

June 23, 1972 United Kingdom..... 29645/72

[52] **U.S. Cl.** **271/174;** 239/563; 271/195; 271/DIG. 2

[51] **Int. Cl.**[2]..... **B65H 29/56**

[58] **Field of Search** ..... 271/174, DIG. 2, 80, 195, 271/97, 98, 108; 355/3; 239/562, 563, 564

[56] **References Cited**

UNITED STATES PATENTS

3,380,733	4/1968	Draugelis	271/DIG. 2
3,724,760	4/1973	Smith	239/564

FOREIGN PATENTS OR APPLICATIONS

170,438	5/1906	Germany	239/563

Primary Examiner—Richard A. Schacher
Assistant Examiner—Bruce H. Stoner, Jr.

[57] **ABSTRACT**

A puffer for removing flexible sheets from a surface, comprising a plurality of air jet orifices that are spaced apart from one another, and a masking member mounted for movement to any one of a plurality of predetermined positions to selectively mask or uncover said orifices. In this way it is possible to ensure that air is puffed only over the paper-carrying part of an electrostatographic drum.

7 Claims, 4 Drawing Figures

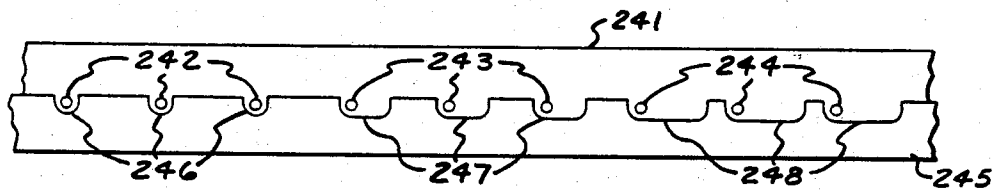


FIG. 1

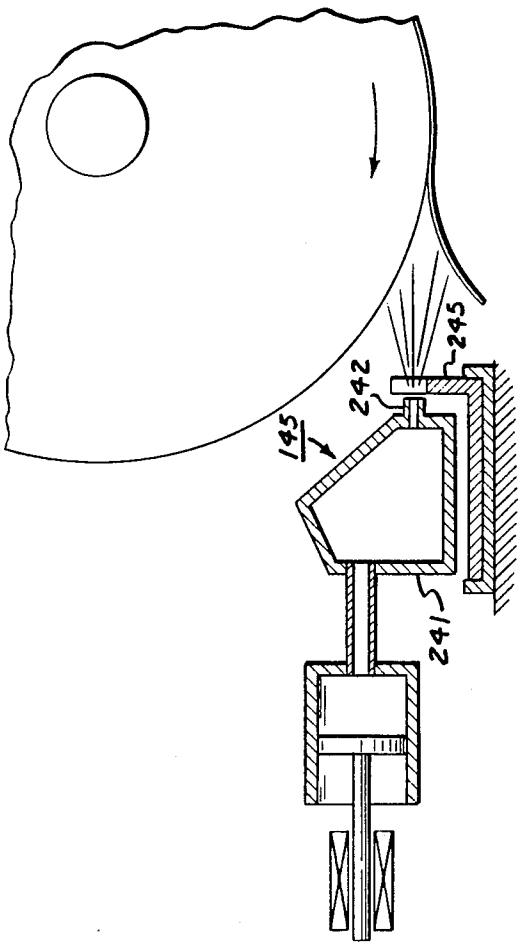


FIG. 2

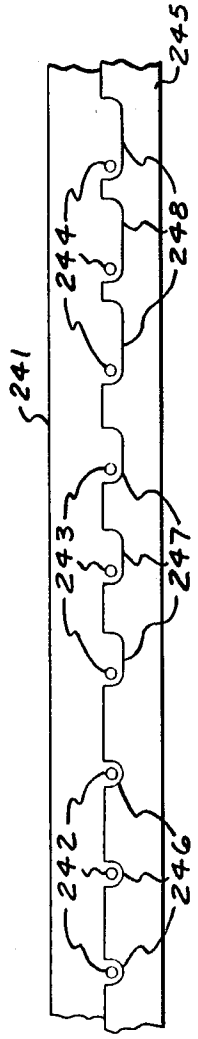


FIG. 3

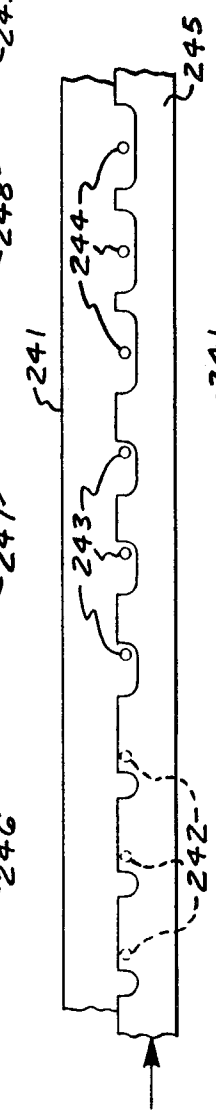
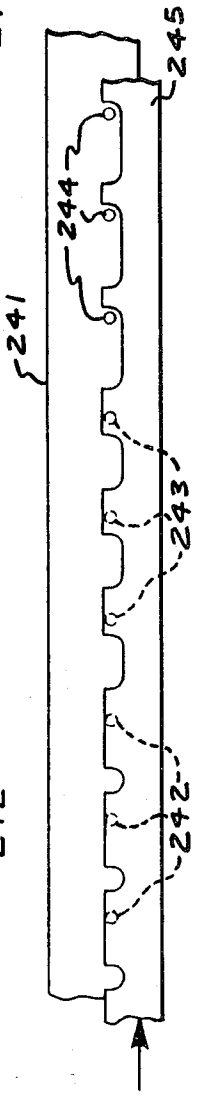


FIG. 4



FLEXIBLE SHEET HANDLING DEVICE

This is a division of application Ser. No. 371,453, filed June 19, 1973, now abandoned.

This invention relates to a flexible-sheet handling device, and is particularly concerned with a device for blowing the leading edge of a sheet away from a smooth surface carrying the sheet. Such a device is known as a "puffer", and has particular, although not exclusive, application in the field of electrostatic copying machines. In such machines, a puffer is used to remove a sheet of copy paper from a surface such as the surface of a xerographic drum, bearing an electrostatic latent image.

In order to increase the versatility of an electrostatographic copying machine, it has been proposed to provide a machine, for example that described in copending application Ser. No. 371,654, filed June 19, 1973, now U.S. Pat. No. 3,865,482, with the facility to accept different widths of copy paper. In these circumstances, the problem arises that when copy papers less wide than the maximum usable width are used, operation of the puffer causes jets of air to be blown over the whole width of the photoconductive drum. This gives rise to the possibility that any stray developer particles on the drum on either side of such narrower sheets of paper will be blown into the machine, forming developer deposits, and possibly causing damage to the machine.

It is an object of the present invention to provide a puffer which avoids these disadvantages.

According to the present invention there is provided a puffer for removing flexible sheets from a surface, comprising a plurality of air jet orifices that are spaced apart from one another, and a masking member mounted for movement to any one of a plurality of predetermined positions to selectively mask or uncover said orifices.

In this way it is possible to ensure that air is puffed only over the paper-carrying part of, for example, an electrostatographic drum.

A puffer in accordance with the invention will now be described, by way of example only, with reference to the accompanying drawing, in which:

FIG. 1 is a cross-sectional elevation of a puffer in accordance with the invention; and

FIGS. 2, 3 and 4 are front views of the puffer showing three different operative positions of a masking member.

Referring to the drawing, the puffer consists of a rigid hollow bar **241** which has a series of puffer jets **242**, 243, and **244**. An L-sectioned masking member **245** is slidably mounted by its horizontal portion beneath the bar **241**, and its vertical portion acts to selectively mask the jets **242, 243** and **244**.

The masking member **245** is shaped as shown in FIGS. **2, 3** and **4** and may be slid into any one of the three positions shown. In the first position, shown in FIG. **2** all the jets **242, 243,** and **244** are uncovered, thereby allowing jets of air to be puffed under the whole width of the widest sheets of paper (for example 24 inches wide) which are to be puffed off the drum of an electrostatographic copying machine.

In FIG. **3**, the masking member **245** has been moved one position to the left, thereby obscuring jets **242**, but leaving jets **243** and **244** open. This allows jets of air to be puffed under an intermediate width (e.g. 18 inches) of paper.

In FIG. **4**, the masking member **245** has been moved to its extreme left position, thereby obscuring jets **242** and **243**, but leaving jets **244** open. This enables jets of air to be puffed only under the narrowest (e.g., 11 inches) width of paper.

As will be appreciated, FIGS. **2, 3** and **4** show only a portion of the puffer. Typically, the complete puffer will consist of a bar of which the portion shown represents the left-hand half; the right-hand half of the hollow bar **145** being a continuation of the left-hand bar, with equally spaced jet orifices, and with the right-hand half of the masking member **245** being a mirror image of the left-hand half.

As can be seen from the drawing, selective masking is achieved by means of recesses cut in the masking member **245**, the left-hand recesses **246**, which correspond with jets **242**, having a width equal to one jet, the central recesses **247**, which correspond with jets **243**, having a width equal to **2** jets, and the right-hand recesses **248**, which correspond with jets **244**, having a width corresponding to three jets. The sliding masking member **245** may be operated either manually, or automatically by means of solenoids. Clearly, the recesses **246**, 267 and **248** could equally well be apertures in the masking member **245**.

In an alternative embodiment (not shown) a hollow bar corresponding with bar **241** may be cylindrical. The masking member in these circumstances may be a cylindrical sleeve which is a sliding fit over the bar. Apertures in the sleeve are arranged to expose different groups of puffer jets on rotation of the sleeve about the bar to predetermined angular positions. The apertures in the sleeve may be circumferentially-spaced apertures, or may be circumferentially-extending slots of lengths which are selected so that on angular movement of the sleeve to one of a plurality of predetermined positions, the required number of jet orifices are uncovered.

We claim:

1. A puffer for removing flexible sheets from a surface, comprising a plurality of air jet orifices spaced apart from one another, and a masking member mounted for movement to any one of a plurality of predetermined positions, to selectively mask or uncover a selected number of said orifices,

wherein said masking member includes masking portions, and uncovering portions in the form of apertures, the uncovering portions being of such dimensions as to uncover selected ones of said orifices by virtue of different dimensions of said uncovering portions, and

wherein said masking member uncovering portions include in succession along said masking member a first group of one or more uncovering portions each of a width sufficient to uncover only one of said orifices, another group of one or more wider uncovering portions each of a width sufficient to uncover twice the width of one of said orifices, and a further group of one or more uncovering portions each of a greater width sufficient to uncover three or more times the width of one of said orifices, whereby on moving the masking member from one predetermined position to another, successively more of said orifices are uncovered.

2. A puffer according to claim 1 wherein said orifices are in a straight line.

3. A puffer according to claim 2 wherein said masking member is a sliding member arranged for sliding movements in the direction of said straight line.

4. The puffer of claim 1 wherein said surface is an electrostatographic drum surface and said orifices extend across said drum surface.

5. A puffer according to claim 1 wherein said orifices are in line and are masked in succession extending from one end of said line toward the other by said movement of said masking member in the direction of said line, and whereby said masking extends much further along said line than said corresponding movement of said masking member.

6. A puffer according to claim 1, wherein said orifices are spaced apart in the direction of movement of said masking member by a distance greater than the width of any of said uncovering portions.

7. A puffer according to claim 6, wherein said orifices are in line and are masked in succession extending from one end of said line toward the other by said movement of said masking member in the direction of said line, and whereby said masking extends much further along said line than said corresponding movement of said masking member.

* * * * *