

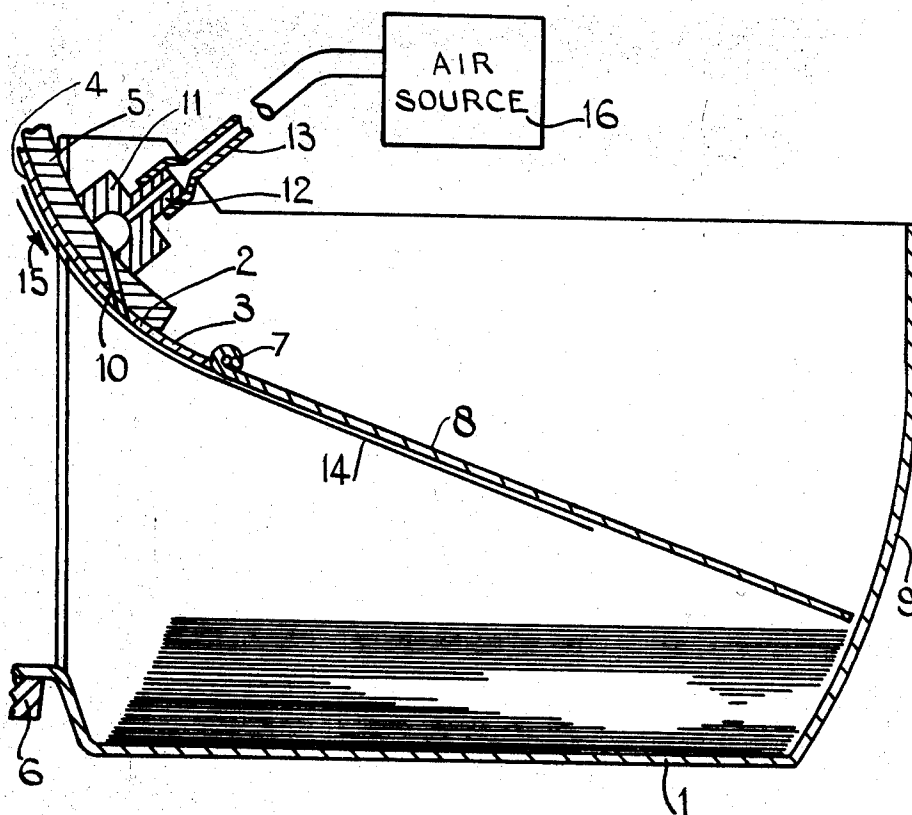
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SHEET FEEDING APPARATUS

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SHEET FEEDING APPARATUS

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1 Claim

ABSTRACT OF THE DISCLOSURE

A sheet feeding arrangement is disclosed in which sheets are fed along the surface of a guide by means of air streams issuing from the surface of the guide. At the end of the guide a hinged extension enters a sheet receptacle. As a sheet is fed along the hinged extension from the guide, it is arrested by an end wall of the receptacle and the air stream then strips the sheet from the extension. As the stack of sheets is built up in the receptacle, the extension pivots about the hinge.

BACKGROUND OF THE INVENTION

The present invention relates to sheet feeding apparatus, and in particular to apparatus for forming a stack from sequentially fed sheets.

Sheet feeding apparatus is known in which sheets are fed along a fixed surface by the action of streams of air issuing from the surface. A receptacle is provided at the end of the surface for receiving the sheets. In order to prevent the sheets being poorly stacked, the stack is supported on a sprung platform so that as the weight of the stack increases, the stack is lowered thereby maintaining the top sheet of the stack at approximately a constant position. Such an arrangement can only receive sheets of a single size or weight since for other sheets the movement of the platform will not maintain the top of the stack at the required position.

SUMMARY OF THE INVENTION

According to the present invention, sheet feeding apparatus includes a first sheet feeding guide having a first surface defining a sheet feeding path; a downstream end of the first sheet feeding guide; a second sheet feeding guide pivotally connected to the downstream end of the first sheet feeding guide and having a second surface defining a continuation of said sheet feeding path; means including at least one air stream issuing from the first surface operative to feed sheets along said sheet feeding path and the continuation of said sheet feeding path.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawing shows a sectional view of part of a sheet feeding arrangement.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, a receptacle 1 is provided at the end of a composite sheet feeding guide 2. The guide 2 consists of a guide plate 3 having a guiding surface 4 supported on a bed plate 5. The bed plate 5 is supported on the main frame 6 of the apparatus. The frame 6 also carries the receptacle 1. A hinge 7 is provided at the end of the plate 3, and a flap 8 extends from the hinge 7 into the receptacle 1, the end 9 of the receptacle remote from the feeding guide 2 being curved closely to follow the path swept out by the end of the hinged flap 8.

An aperture 10 is formed in the sheet feeding guide 2 and a recessed block 11 is secured to the rear surface of the bed plate 5 opposite the aperture 10. The block 11 also has a hollow projection 12 to permit a connection 13 to be made between the aperture 10 and a source 16 of air under pressure. The aperture 10 is angled through the guide 2 in the direction of feeding of sheets, such as the sheet 14, along a feeding path closely following the surface 4 of the guide plate 3. The feeding direction is indicated in the drawing by arrow 15.

In operation a sheet is propelled along the feeding path in the direction of arrow 15. Air is supplied through aperture 10, and the air stream from the aperture 10 creates a pressure differential layer in the vicinity of the surface 4 of the guide plate 3, with the result that as a sheet 14 is advanced it is held by air pressure spaced slightly away from the surface 4. The angular disposition of the aperture 10 causes the air stream to propel the sheet along the feeding path. It will be realised that in practice the sheet feeding guide 2 carries a number of apertures 10 spaced apart along its length, so that a sheet 14 is moved along the feed path under the influence of succeeding ones of the apertures 10.

Initially the flap 8 has its free end resting upon the bottom of the receptacle 1. The flap 8 forms a continuation of the feeding guide, and the first sheet 14 to be fed along the guide follows the underside of the flap 8 into the receptacle. When the leading edge of the sheet 14 reaches the end 9 of the receptacle it is arrested. At this point the sheet then becomes unstable and moves away from the surface of the flap 8, the air jet issuing from the last aperture 10 then tending to push the arrested sheet downwards to lie along the bottom of the receptacle. Once the trailing edge of this sheet has left the feeding path a further sheet advancing along the feed path will move between the original sheet and the flap 8 until it, too, is halted by contact of its leading edge with the end 9 of the receptacle. Thus, each succeeding sheet is advanced into the receptacle until its leading edge reaches the end of the receptacle, and the trailing edge then moves away from the feeding guide, being aided by the air stream from the aperture 10.

Moreover, the leading edge of each succeeding sheet moves the free end of the flap 8 away from the bottom of the receptacle 1 so that the sheet can reach the end 9 of the receptacle. The free end of the flap 8 tends to hold the leading edge of the sheet in position while the sheet settles onto the preceding ones. Thus, a tidy stack is formed by the joint action of the flap 8, in holding one end of each document in turn, and the air stream from the aperture 10, in assisting the sheets to settle into the stack. It will be clear from the foregoing description that as the leading edge of each succeeding sheet is moved under its free end, the flap 8 rises in the receptacle.

Thus the position and weight of the flap 8 must be related to the size and stiffness of the sheets and these factors also influence the pressure and flow rate of the air stream from the aperture 10 in order to ensure that each sheet is fed correctly to the end of the receptacle in order to form a tidy stack.

Although the receptacle shown is arranged to form a stack of horizontal sheets, it is to be understood that the sheets may alternatively be supported in the stack at an angle to the horizontal. In this case, the end 9 of the receptacle supports the ends of the individual sheets. Moreover, it is not essential that the hinged flap 8 should extend to the end 9 of the receptacle, so that the end 9 need not be curved in the manner shown.

I claim:

1. Sheet feeding apparatus including a first sheet feeding guide having a first surface and a downstream end; a

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second sheet feeding guide having a second surface providing a continuation of the first surface in a downstream direction; arresting means for arresting the leading edge of the sheet while the sheet is being fed over said first and second surfaces; a pivotal connection between the second sheet feeding guide and the downstream end of the first sheet feeding guide; said second sheet feeding guide being movable about the pivotal connection relative to the first sheet feeding guide; and means for producing an air stream having a component of motion directed along the first surface in a downstream direction effective to feed sheets along a path defined by the first and second surfaces, said air stream being effective upon

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arrest of said leading edge of the sheet to move the sheet away from said first and second surfaces.

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