July 21, 1964 F. B. CURTENIUS 3,141,706

AIR FILM TABLE

Filed Dec. 18, 1961

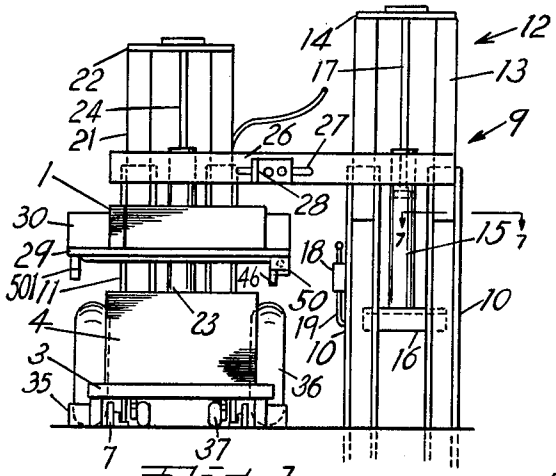


Fig. 1

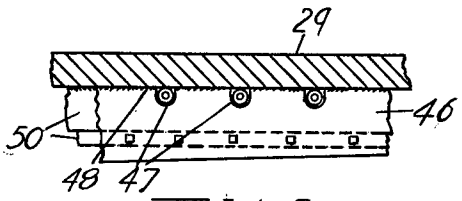


Fig. 4

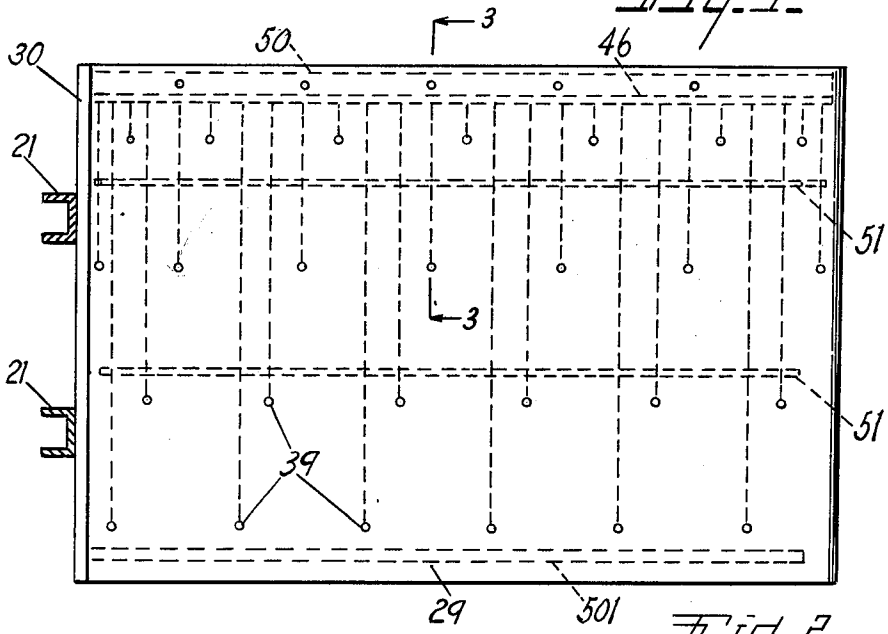


Fig. 2

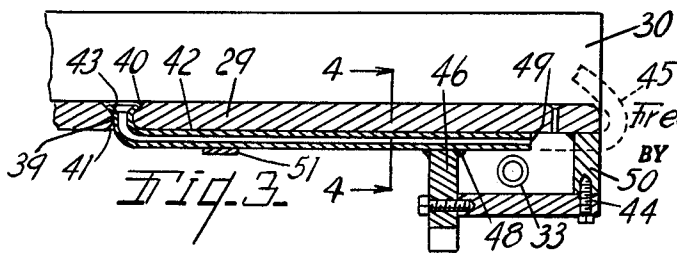


Fig. 3

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AIR FILM TABLE

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This invention relates to improvements in air film table. The principal objects of this invention are:

First, to provide an air film plate adapted for use as a supporting platform on a vertical lift truck which will require a minimum of vertical clearance on the bottom of the plate to permit the plate to be lowered to a standard commercial skid or pallet.

Second, to provide an inexpensive supporting plate particularly for supporting piles of paper with a novel structure for distributing air under pressure to the surface of said plate.

Third, to provide an air film plate in which the air distribution mechanism requires little thickness so that the load supporting portion of the plate constitutes the major portion of the vertical thickness of the plate permitting the plate with its air distribution structure to be positioned closely above other structures such as a skid or stack to which a pile of paper is to be transferred from the plate.

Fourth, to provide a novel structure for distributing air under pressure from a manifold source to a plurality of dispersed positions on a plate without leaking air except through the orifices provided for the purpose in the plate.

Other objects and advantages of the invention will be apparent from a consideration of the following description and claims. The drawings, of which there is one sheet, illustrate a highly practical form of the air film plate of the invention as applied to an industrial lift truck.

FIG. 1 is an end elevational view of the invention mounted on a lift truck and associated with paper piling apparatus.

FIG. 2 is an enlarged fragmentary top plan view of the air film plate and its connection to the truck.

FIG. 3 is a fragmentary vertical cross sectional view taken along the plane of the line 3—3 in FIG. 2.

FIG. 4 is a fragmentary cross sectional view taken along the plane of the line 4—4 in FIG. 3.

The example of the air film plate of the invention illustrated shows the plate as the vertically adjustable support on the industrial type lift truck but it will be understood that the air film plate and the air distributing structure thereof may be used in other connections. The drawings conventionally illustrate an industrial truck having drive wheels **36** and forward supporting wheels **37** either of which may be steerable but when used in conjunction with the guide rails or track **7** no steering is involved. The truck and lift structures briefly described and illustrated constitutes no part of the present invention except as the air film plate is mounted on one of the structures for horizontal movement and vertical adjustment relative to the other so the details of the truck and hoists are not disclosed.

The plate **29** is provided with a multiplicity of bores **39** formed vertically therethrough and distributed over the surface thereof in a more or less regular pattern. The bores **39** are for emitting jets or streams of compressed air to produce an air film on the surface of the table underneath a pile of paper to facilitate sliding of the pile onto or off of the plate. The upper surface of the plate is generally smooth to facilitate sliding but minutely grained to facilitate air distribution. As appears more clearly in FIG. 3 each of the bores **39** is counterbored along a flared surface as at **40** and is

counterbored from the bottom along a curved conical surface **41**. A small diameter copper tube **42** has its outer end flared as at **43** into the shape of a cone seating mechanically and sealingly against the flared counter bore **40**. Laterally of the flare **43**, the tube is bent in conforming engagement with the curved counterbore **41** and directed in close contact with the bottom of the plate **29** to the air manifold **44** secured along the bottom of the plate at one side thereof. The tubes **42** are cut to approximate length and flared at one end as at **43** after which they are inserted singly in the appropriate bore **12** and bent snugly along the bottom of the plate **29** and bent temporarily around the side of the plate as shown by the dotted lines **45** to hold the tubes under tension. The inner wall **46** of the manifold is provided with U-shaped slots **47** formed in the edge of the wall of the manifold to straddle the tubes. (See FIGS. 3 and 4.) After the tubes are stretched along the bottom of the plate a quantity of solder or brazing **48** is flowed around the slots and the edge of the plate of the manifold wall to hold the tubes and wall permanently in place with the tubes under tension. This operation is best accomplished with the plate **29** in inverted position. The tubes are then cut off at **49** and the other walls **50** of the manifold built up on the plate and connected to the air source **33**.

The plate **29** as started, is made thick enough to support the intended load and since the tubes **42** do not reduce the strength of the plate, this plate thickness can be maintained at a minimum. To further reduce the thickness of the plate **29** the inner wall **46** of the manifold may constitute a reinforcing rib or rail and a similar rail **501** may be secured to the underside of the opposite edge of the plate, the rails being spaced far enough to straddle the skid **3**. The bores **39** are relatively inexpensive to form as compared to the grooves used in some prior air film plates. As a precaution against displacement, the tubes **42** may be further held in place by strips of adhesive tape **51**, but as pointed out above it is the tension developed in the tubes themselves which holds them in place. The assembled plate functions in the ordinary manner as an air film plate for slidably receiving, supporting and discharging piles of paper or other flat material. Due to the relative thinness of the plate and tubes, this form of air film plate is particularly adapted for use on the hoist **21** because it will lower the surface of the plate close to the surface of the pallet **3** or pile **4** for smooth and accurate transfer of the stacks **1** to the pile as described.

What is claimed as new is:

1. An air film table comprising,
a plate having a smooth load supporting surface,
a sectional manifold positioned along one edge of said plate extending to below the bottom surface of the plate,
said plate defining a multiplicity of bores dispersed over its surface with conical counterbores at their upper ends and curved surfaces at their lower ends directed toward said manifold,
a multiplicity of small tubes each having a flared end seated in one of said conical counterbores and being curved along the curved surface and lapped along the bottom of the plate and extending into said manifold,
said tubes being tensioned between said manifold and the flared ends of the tubes,
and means removably closing said manifold.

2. An air film table comprising a flat plate having a multiplicity of bores formed therethrough at dispersed points,
the upper ends of said bores having conical counterbored surfaces,

the lower ends of said bores having convexly curved counterbored surfaces,
walls forming a manifold with an exposed edge disposed along one edge of said plate,
said exposed edge having a multiplicity of notches therein,
a multiplicity of tubes each having a flared end seated in one of said counterbores in the top of said plate and stretched along the bottom of said plate and retained under tension stress in one of said notches by solidified sealing material in said notches,
a cover closing said manifold and the ends of said notches,
and a pressure supply connection to said manifold.

3. An air film table comprising a flat plate having a multiplicity of bores formed therethrough at dispersed points,
the upper ends of said bores having conical counterbored surfaces,
the lower ends of said bores having convexly curved surfaces,

walls forming a manifold with an exposed edge disposed along one edge of said plate,
said exposed edge having a multiplicity of notches therein,
a multiplicity of tubes each having a flared end seated in one of said counterbores in the top of said plate and stretched along the bottom of said plate and retained under tension stress in one of said notches,
a cover closing said manifold and the ends of said notches,
and a pressure supply connection to said manifold.

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