Feb. 8, 1966 R. J. VALENTINE 3,233,952

DRAWER CONSTRUCTION

Filed May 26, 1964

FIG. 1.

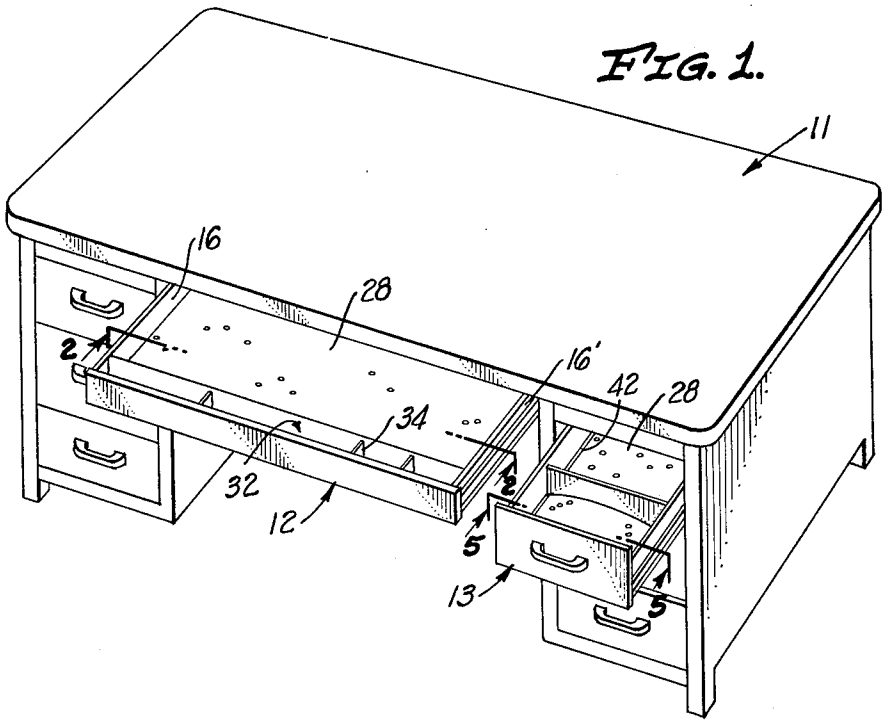


FIG. 2.

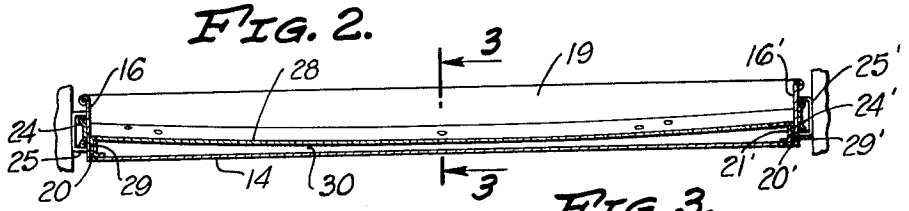


FIG. 3.

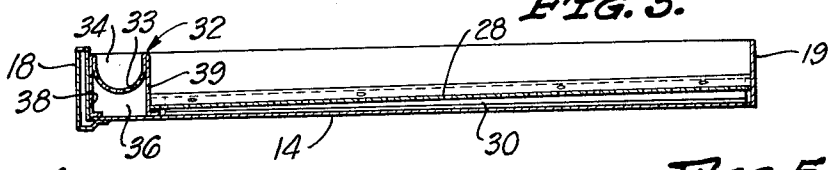


FIG. 4.

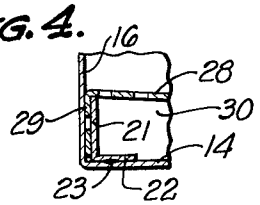


FIG. 5

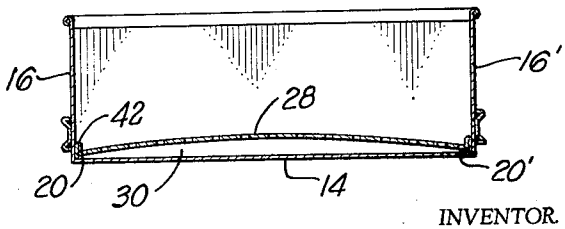
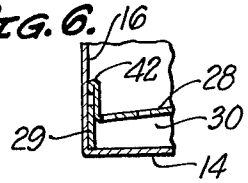


FIG. 6.



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DRAWER CONSTRUCTION

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14 Claims. (Cl. 312—229)

The present invention relates to drawers having a perforated false bottom permitting dust and debris to settle to an out-of-sight position. Movement of dust or small debris through the perforations of the false bottom is facilitated by the normal fore-and-aft movement of the drawer as explained in my Patent No. 3,089,744. The present invention is an improvement over the structure disclosed and claimed in my prior patent.

It is an object of the present invention to provide an improved structure for supporting a perforated sheet above the bottom of a drawer to provide a dust space therebetween. In this respect it is an object of the invention to provide support portions or flanges at the edge of the sheet serving this function irrespective of the contour of the upper surface of the perforated sheet.

In accordance with the present invention the small particles reaching the dust space can be cleaned therefrom by use of a vacuum cleaner hose without lifting the perforated sheet from the drawer, permitting the perforated sheet to be fixed in the drawer during manufacture. In other instances the perforated sheet may be removable from the drawer and can be sold as an article of manufacture to be inserted in existing drawers.

With the perforated sheet flat and level it has been found in practice that normal fore-and-aft movement of the drawer causes articles supported by the sheet to shift gradually backward toward the rear of the drawer. This is probably the result of the inertia of the articles and the normal subconscious tendency to open the drawer more rapidly or with quicker acceleration than during its closing. It is an object of the invention to mount the perforated sheet in the drawer in a position inclined upwardly toward the rear of the drawer. Only a slight inclination is sufficient to prevent the aforesaid shifting whether the perforated sheet be planar or slightly curved axially or laterally. The resulting dust space is slightly deeper at the rear of the drawer, giving greater storage depth for any dust or debris filtering through the perforated sheet and tending likewise to shift to the rear upon normal fore-and-aft drawer movement.

While the perforated sheet may be substantially planar it is sometimes desirable that its top surface be slightly curved in a direction transverse to the drawer axis to increase the rigidity of the sheet and its resistance against excessive bending due to weight of articles carried thereon. In this respect the perforated sheet can be arched upward or dished into a catenary-like shape. The latter is particularly suitable for wider drawers such as the center drawer of a desk. An upwardly arched sheet is often desirable in narrower drawers such as in a side drawer of a desk. It is an object of the invention to provide for supporting a perforated sheet in a drawer in such arched or dished configuration whether or not the sheet is also inclined slightly in an axial direction. The slight arched or dished configuration of the sheet tends to prevent articles in the drawer from shifting about as the drawer is opened and closed. Because of its perforations, the sheet provides a somewhat roughened surface tending to impede sidewise shifting of paper or articles. However if several sheets of paper are placed in the drawer to one side thereof the arched nature of the perforated plate tends, with normal drawer operation, to maintain the papers neatly stacked against the corresponding side member of the drawer.

It is another object of the invention to support the perforated sheet from its side edges and in a manner usually eliminating the need for intermediate supports. In this

connection it is an object of the invention to provide support flanges at opposite sides of the flexible sheet extending respectively into pocket spaces of a drawer. In one embodiment of the invention it is an object to employ two upstanding flanges secured to the bottom wall of the drawer respectively bounding the pocket spaces and giving lateral and/or vertical support to that portion of the perforated sheet therebetween. A further object is to support a perforated sheet snugly in a drawer to prevent shifting therein and in a manner to eliminate rattle or noise as the drawer is opened and closed.

Another object of the invention is to terminate the forward edge of such a perforated sheet short of the front wall of the drawer, providing therebetween a lateral zone in which is disposed a tray for small articles. A further object is to employ a trough-shaped bottom wall for this tray, made of sheet material with at least some perforations therein, together with means for supporting this wall above the bottom wall of the drawer to form an auxiliary dust space therebetween. Other objects reside in the provision of a tray made entirely of sheet material with one or both edge portions bent downward to form tray-support flanges.

Further objects and advantages of the invention will be evident to those skilled in the art from the following description of exemplary embodiments.

Referring to the drawing:

FIG. 1 is a perspective view of a desk having drawers embodying two species of the invention;

FIG. 2 is a transverse sectional view of the center drawer, taken along the line 2—2 of FIG. 1;

FIG. 3 is a section taken along the line 3—3 of FIG. 2;

FIG. 4 is an enlarged view of a portion of FIG. 2 but eliminating the drawer guides thereof;

FIG. 5 is a cross-sectional view of a smaller drawer of FIG. 1 taken along the line 5—5 thereof; and

FIG. 6 is an enlarged fragmentary view of a portion of FIG. 5 but eliminating the drawer guides thereof.

FIG. 1 exemplifies a typical metal office desk 11 having a relatively wide central drawer 12 and a number of side drawers 13. As best shown in FIGS. 1–4 the center drawer 12 includes a quadrilateral bottom wall 14, usually of rectangular shape, and two opposed substantially parallel side members 16 and 16′ rising therefrom and suitably fixed thereto. The front and rear sides of the drawer are commonly formed by front and rear members or walls 18 and 19. The members 16, 16′, 18 and 19 may be of any suitable material, a welded-flange all-metal construction being exemplified. Pocket spaces 20 and 20′ are formed at the junction of the bottom wall 14 and the respective side members 16 and 16′. In the embodiment of FIG. 5 each pocket space is of right-angular configuration. In the embodiment of FIGS. 2–4 the pocket spaces are bounded inwardly by upstanding flanges 21 and 21′ of angular clips. The base flanges 22 of these clips are at right angles to the upstanding flange 21 and are welded or otherwise secured at 23 (FIG. 4) to the bottom of the drawer. Upwardly-open flange-receiving spaces are thus provided between the upstanding flanges and their respective side members 16, 16′.

Any suitable guide means may be employed for guiding the fore-and-aft movement of the drawers. In the metal construction shown these are exemplified as including slide members 24 and 24′ secured to the side members of the drawer and sliding in guide members 25 and 25′ attached to the desk.

In the embodiments of FIGS. 2–4 a quadrilateral perforated sheet 28 has support flanges 29 and 29′ at its opposite sides, forming a part of a means for supporting the perforated sheet above the bottom wall 14 to provide a dust space 30 therebetween. This perforated sheet may

be of any suitable material with its perforations disposed above the dust space 30 in a uniform pattern or in a pattern of suitable design. In the illustrated embodiment the support flanges 29 and 29' are downwardly-bent edge portions of a metal perforated sheet, such flanges being spaced to extend downward in the upwardly-open narrow spaces between the upstanding flanges 21, 21' and the respective side members 16, 16' of the drawer. That portion of the perforated sheet suspended between the flanges 29 and 29' may be initially planar in which event it may deform slightly into dished shape (FIG. 2) by the weight of articles placed in the drawer. Alternatively such portion may be initially slightly dished when the perforated sheet is installed, as by slightly bending this central portion or making the distance between the outer surfaces of the flanges very slightly greater than the distance between the inner surfaces of the side members 24, 24' and dishing the sheet downwardly during its installation. A planar or slightly initially dished shape is preferred. In this embodiment the upstanding flanges 21 and 21' laterally anchor the edges of the sheet against forces exerted on the sheet by the weight of articles placed thereon, which forces tend to dish the sheet or deflect it downwardly.

The flanges 29, 29' of the embodiment of FIGS. 2–4 may extend downward such distance that their lower edge portions engage the bottom wall 14 of the drawer to support the sides of the sheet. Alternatively or in addition the upstanding flanges 21, 21' may be of such height that their upper edge portions engage the bottom surface of the perforated sheet 28 to support the sides thereof. The latter represents the preferred structure. In this instance the flanges 29, 29' may be of such height that their lower edge portions do not reach the bottom wall 14. Thus either or both of the paired flanges 21, 29 and 21', 29' may serve to support the sides of the perforated sheet and determine the height of the side portions of the dust space 30.

It is preferred that one of the flanges of each pair should taper in height from front to back of the sheet, being of slightly greater height at the back thereof. The result is that the top surface of the planar or dished perforated sheet slopes slightly upward toward the back of the drawer to provide a dust space 30 that is deeper at the back than the front. In the preferred practice the upstanding flanges 21, 21' taper slightly in height and provide upper edge portions snugly engaging the bottom of the perforated sheet along support sockets formed at the intersection of the main portion of the perforated sheet and the depending flanges 29.

The front edge of the perforated sheet 28 may extend to the front wall 18 of the drawer in abutting relation, as in the drawer 13 of FIG. 1, or may terminate short thereof, as in the drawer 12, to provide a lateral zone therebetween in the front interior of the drawer. In this lateral zone may be disposed a tray 32 having a trough-shaped bottom wall 33. The resulting trough-like space is adapted to receive pencils or other small articles and may be partitioned at intervals by fixed or adjustable partitions 34 (FIG. 1). In the preferred embodiment the tray 32 is made of sheet metal and the lower section of the trough-shaped bottom wall 33 is perforated and supported above the bottom wall 14 of the drawer to provide an auxiliary dust space 36. Dust or small debris from the tray can thus filter into this auxiliary dust space.

Any suitable means may be employed for supporting the trough-shaped bottom wall 33, preferably one or more depending flanges resting on the bottom wall 14. In this connection FIGS. 1 and 3 illustrate a tray made entirely of a strip of sheet metal having two edge portions and an inner portion joined thereto along parallel bend lines. Only the central area of the inner portion is perforated. The edge portions are bent downward along the respective bend lines to form tray-support flanges 38 and 39 respectively lying along the inner surface of the front wall 18 and the front edge of the perforated sheet 28. The lower edges of these flanges engage the bottom wall 14 of the drawer and if desired may be bent rearwardly to increase the support area and form a convenient means for welding the tray 32 in place to the bottom wall 14 if the tray is to be a permanent part of the drawer. Preferably however the tray is made removable and not attached to the forward edge of the perforated sheet 28. It should be understood however that such attachment can be employed, in which case the height of the forward portion of the main dust space 30 can be determined by this attachment. The upstanding flanges 21, 21' are foreshortened so as not to extend into the lateral zone occupied by the tray 32.

In the embodiments of FIGS. 5 and 6, particularly suited for narrower drawers, the perforated sheet 28 is arched slightly so that the depth of the dust space 30 is slightly less at the sides of the drawer than along the central axial midplane thereof. The support flanges 29, 29' can be bent directly downward as in the embodiment previously described and may extend into the pocket spaces 20 and 20' as aforesaid. However in FIGS. 5 and 6 the edge areas of the sheet are bent upward and thence downward to provide an upwardly-extending portion and a downwardly-extending portion forming at their junction an elongated crest 42 disposed above the upper surface of the sheet and parallel to the corresponding pocket space. The lowermost portion of this downwardly-extending portion then forms the support flange 29. If the lateral distance between the two downward extending portions is made minutely greater than the spacing of the inner surfaces of the side members 16, 16' of the drawer the central portion of the perforated sheet 28 can be arched as suggested in FIG. 5, being held in arched shape by lateral pressure applied to its support portions by these side members of the drawer. The weight of any articles in the drawer increases the compression forces in the arched perforated sheet 28 but these forces are resisted by the side members 16, 16'. The flange construction shown is desirable in distributing the lateral pressure over a greater area of the side walls and in permitting the compression forces in the perforated plate to be transferred to the flange structure at a position about half way between its lower edge and the elongated crest 42.

If the perforated sheet 28 is dished as in FIG. 2 or arched as in FIG. 5 it is curved about a curve axis lying in the vertical axial midplane of the drawer. With the dished configuration of FIG. 2 the curve axis will be a substantial distance above the bottom wall 14. With the arched configuration of FIG. 5 it will be a substantial distance below this bottom wall. The difference in depth of the dust space 30 in different areas thereof is small, usually a small fraction of an inch. Likewise the maximum depth of this dust space is small so as to occupy only a small lower portion of the volume of the drawer space. The minimum depth of a dust space between a curved and/or sloped perforated sheet will usually be only a very small fraction of an inch, e.g. about $\frac{1}{8}$–$\frac{3}{16}$".

Various changes and modifications can be made without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. In combination: a drawer having a quadrilateral bottom wall and two opposed substantially parallel side members rising therefrom forming respective pocket spaces at the junctions of the inner faces of said side members with said bottom wall, said drawer having a fore-and-aft axis parallel to said side members; a perforated flexible sheet; and support means at the sides of said sheet supporting same above said bottom wall to form a dust space therebetween, said support means including support flanges exclusively at opposite sides of said flexible sheet extending below the lower surface of said sheet respectively into said pocket spaces, said support flanges having

outer faces that are spaced apart a distance slightly greater than the distance between said inner faces of said side members when said flexible sheet is flat, said outer faces respectively pressurally engaging the inner faces of said side members, that portion of said perforated sheet between said support flanges being curved about a curve axis parallel to said fore-and-aft axis as a result of said pressural engagement, said curve axis lying in the vertical midplane of said drawer.

2. A combination as defined in claim 1 in which the perforated sheet is curved about a curve axis that is a substantial distance above said bottom wall, and in which the upper surface of said perforated sheet is dished, the sides of said dust space being of greater height than the central portion thereof.

3. A combination as defined in claim 1 in which the perforated sheet is curved about a curve axis that is a substantial distance below said bottom wall to form an arched upper surface of said perforated sheet, the sides of said dust space being of lesser height than the central portion thereof.

4. In combination: a drawer having a quadrilateral bottom wall with two substantially parallel side members, a front member and a rear member rising therefrom to form a drawer space; a quadrilateral perforated sheet shaped to fit said drawer space, said perforated sheet having a front edge terminating short of said front wall to provide a lateral zone therebetween in the front of said drawer space; means for supporting said perforated sheet above said bottom wall to form a shallow dust space therebetween; and a tray in said lateral zone, said tray including a trough-shaped bottom wall formed of sheet material and tray-support means for supporting said trough-shaped wall above said bottom wall of said drawer to form an auxiliary dust space therebetween, at least the bottom portion of said trough-shaped bottom wall being perforated to provide perforations that open downwardly on said auxiliary dust space.

5. A combination as defined in claim 4 in which said tray comprises a strip of sheet material having an edge portion and an inner portion adjoining same along a bend line, said inner portion being bent into said trough shape, said edge portion being bent downward along said bend line to form a flange having a lower edge engaging said bottom wall of said drawer, said flange and said lower edge forming at least a part of said tray-support means, the junction of said flange and said trough-shaped portion forming a crest extending laterally of said drawer above the top surface of said perforated sheet.

6. A combination as defined in claim 4 in which said tray comprises a strip of sheet metal having two edge portions and an inner portion therebetween joined thereto along parallel bend lines, said inner portion being bent into said trough shape, said edge portions being bent downward along the respective bend lines to form flanges having lower edges engaging said bottom wall of said drawer, said flanges and said lower edges forming said tray-support means, one of said flanges lying along the inner surface of said front wall, the other of said flanges lying adjacent said front edge of said perforated sheet.

7. In combination: a drawer having a quadrilateral bottom and two opposed substantially parallel side members rising therefrom forming respective pocket spaces at their junctions with said bottom wall; a sheet of perforated metal having upper and lower surfaces; and support means for supporting said perforated sheet above said bottom wall to provide a dust space therebetween, said supporting means consisting of two opposed edge areas of such sheet each bent upward and thence downward to provide an upwardly extending portion and a downwardly extending portion forming an elongated crest lying above the upper surface of said sheet immediately adjacent a corresponding side member of said drawer and extending parallel to the corresponding pocket space, the lowermost portion of said downwardly extending portion comprising a depending portion terminating in a lower edge within the corresponding pocket space, said lower edge being at a level below said lower surface of said sheet and engaging the bottom wall of said drawer to support such lower surface above such bottom wall and form said dust space therebetween, the outer faces of said downwardly extending portions respectively engaging the inner faces of said side members of said drawer.

8. In combination: a drawer having a quadrilateral bottom wall, two opposed substantially parallel side walls attached thereto and rising therefrom forming respective pocket spaces at their junctions with said bottom wall; two upstanding flanges secured to said bottom wall positioned respectively inward of said side members forming the inner boundaries of said pocket spaces, there being an upwardly-open unobstructed flange-receiving space between each upstanding flange and its corresponding side wall, each upstanding flange having a top edge disposed a small distance above said bottom wall; and a perforated flexible sheet having depending flanges at opposite sides extending below the lower surface of said sheet respectively into said flange-receiving spaces and paired with the corresponding upstanding flanges, the lower surface of said sheet resting on said top edges and supported thereby to hold said lower surface above said bottom wall and form a shallow dust space therebetween.

9. In combination: a drawer having a quadrilateral bottom wall and two opposed substantially parallel side members rising therefrom forming respective pocket spaces at their junctions with said bottom wall, said drawer having a fore-and-aft axis parallel to said side members; a perforated flexible sheet; and support means exclusively at the sides of said sheet supporting same above said bottom wall to form a dust space therebetween, said support means including support flanges at opposite sides of said flexible sheet extending below the lower surface of said sheet respectively into said pocket spaces, said support means including means for supporting said perforated sheet in said drawer in an inclined position sloping slightly upwardly toward the back of said drawer whereby said dust space is deeper at the back of said drawer than at the front thereof, said flexible perforated sheet when flat having a width between the outer faces of its support flanges slightly greater than the distance between said side members, said flexible sheet being held in curved shape in said drawer by lateral pressure applied to its support flanges by said side member, said flexible sheet in said curved shape curving about a curve axis parallel to said fore-and-aft axis and lying in the vertical midplane of said drawer.

10. In combination: a drawer having a quadrilateral bottom wall and two opposed substantially parallel side members rising therefrom forming respective pocket spaces at their junctions with said bottom wall, said drawer having a fore-and-aft axis parallel to said side members; a perforated flexible sheet; and support means exclusively at the sides of said sheet supporting same above said bottom wall to form a dust space therebetween, said support means including support flanges at opposite sides of said flexible sheet extending below the lower surface of said sheet respectively into said pocket spaces with each of said support flanges tapering in height from front to back of said sheet and being of greater height at the back thereof whereby said top surface of said sheet slopes slightly upwardly toward the back of said drawer and whereby said shallow dust space is deeper at the back of said drawer than at the front thereof, said flexible perforated sheet when flat having a width between the outer faces of its support flanges slightly greater than the distance between said side members, said flexible sheet being held in arched shape in said drawer by lateral pressure applied to its support flanges by said side members.

11. In combination: a drawer having a quadrilateral bottom wall and two opposed substantially parallel side members having top surfaces parallel to said bottom wall, the side members rising therefrom forming respective

pocket spaces at their junctions with said bottom wall; a perforated flexible sheet; and support means at the sides of said sheet supporting same above said bottom wall to form a dust space therebetween, said support means including support flanges at opposite sides of said flexible sheet respectively engaging said side members of said drawer and extending below the lower surface of said sheet respectively into said pocket spaces, each support flange tapering in height from front to back of said sheet and being of slightly greater height at the back thereof whereby said top surface of said sheet slopes upward toward the back of said drawer and whereby said shallow dust space is slightly deeper at the back of said drawer than at the front thereof.

12. In combination: a drawer having a quadrilateral bottom wall, two opposed substantially parallel side walls attached thereto and rising therefrom forming respective pocket spaces at their junctions with said bottom wall; two upstanding flanges secured to said bottom wall positioned respectively inward of said side members forming the inner boundaries of said pocket spaces, there being an upwardly-open flange-receiving space between each upstanding flange and its corresponding side wall; and a perforated flexible sheet having depending flanges at opposite sides extending below the lower surface of said sheet respectively into said flange-receiving spaces and paired with the corresponding upstanding flanges, at least one of the flanges of each pair being of a height to hold said lower surface above said bottom wall and form a shallow dust space therebetween, the upstanding flange and the depending flange of each pair of overlapping substantially throughout the heights thereof.

13. In combination: a drawer having a quadrilateral bottom wall, two opposed substantially parallel side walls attached thereto and rising therefrom forming respective pocket spaces at their junctions with said bottom wall; two upstanding flanges secured to said bottom wall positioned respectively inwardly of said side members forming the inner boundaries of said pocket spaces, there being an upwardly-open flange-receiving space between each upstanding flange and its corresponding side wall; and a perforated flexible sheet having depending flanges at opposite sides extending below the lower surface of said sheet respectively into said flange-receiving spaces and paired with the corresponding upstanding

flanges, at least one of the flanges of each pair being of a height to hold said lower surface above said bottom wall and form a shallow dust space therebetween, at least one of the flanges of each pair tapering in height from the front to back and being of slightly greater height at the back of the drawer whereby said shallow dust space is slightly deeper at the back than at the front.

14. In combination: a drawer having a quadrilateral bottom wall, two opposed substantially parallel side walls attached thereto and rising therefrom forming respective pocket spaces at their junctions with said bottom wall; two upstanding flanges secured to said bottom wall positioned respectively inward of said side members forming the inner boundaries of said pocket spaces, there being an upwardly-open flange-receiving space between each upstanding flange and its corresponding side wall; and a perforated flexible sheet having depending flanges at opposite sides extending below the lower surface of said sheet respectively into said flange-receiving spaces and paired with the corresponding upstanding flanges, at least one of the flanges of each pair being of a height to hold said lower surface above said bottom wall and form a shallow dust space therebetween, said upstanding flanges tapering in height from front to back and being of slightly greater height at the back of the drawer, there being support sockets at the junction of said perforated sheet and said depending flanges, said upstanding flanges providing upper edge portions extending into said support sockets in supporting relation with said perforated sheet.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,233,952 February 8, 1966

Richard J. Valentine

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 7, line 31, strike out "of", second occurrence.

Signed and sealed this 31st day of January 1967.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents