United States Patent [19]

Lundberg

[11] **3,853,364**

[45] **Dec. 10, 1974**

[54] **FILING CABINET CONTAINING STORING FRAMES FOR SUSPENDED SHEETS**

[76] Inventor: **Kurt Bonnie Karl Axel Lundberg,** Malarvagen 1, 141 71 Huddinge, Sweden

[22] Filed: **Dec. 7, 1972**

[21] Appl. No.: **313,056**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 183,152, Sept. 23, 1971, abandoned.

[30] **Foreign Application Priority Data**

Dec. 22, 1970	Sweden	17473/70
Sept. 24, 1971	Great Britain	44551/71
Dec. 12, 1971	Australia	36893/71

[52] **U.S. Cl.** **312/184,** 312/323, 312/342, 312/345

[51] **Int. Cl.** **B42f 17/00**

[58] **Field of Search** 312/183, 184, 323, 342, 312/345

[56] **References Cited**

UNITED STATES PATENTS

546,647	9/1895	Barnes	312/323 X
1,381,907	6/1921	Delisle	312/184
2,370,664	3/1945	Hubbell	312/184
2,967,079	1/1961	Parvis	312/184

Primary Examiner—James C. Mitchell

Attorney, Agent, or Firm—Sughrue, Rothwell, Mion, Zinn & Macpeak

[57] **ABSTRACT**

A filing cabinet for the storing of thin sheet-like articles such as drawings, blue prints, maps or the like comprises one or a number of storing frames each having a pivotable frame part in which the sheets are suspended. Each said frame part is pivotable between a horizontal position in which easy handling of the sheets is permitted, and a vertical position in which the sheets are stored close to each other. The frames may serve as or be displaceable into and out of the cabinet in a direction parallel to the axis of said pivot. A protection shield comprising at least three parts linked to each other keeps the sheets closely packed together in the storing position and avoids the risk of damage to the sheets. Each storing frame may be provided with roller, guide and stop means.

24 Claims, 13 Drawing Figures

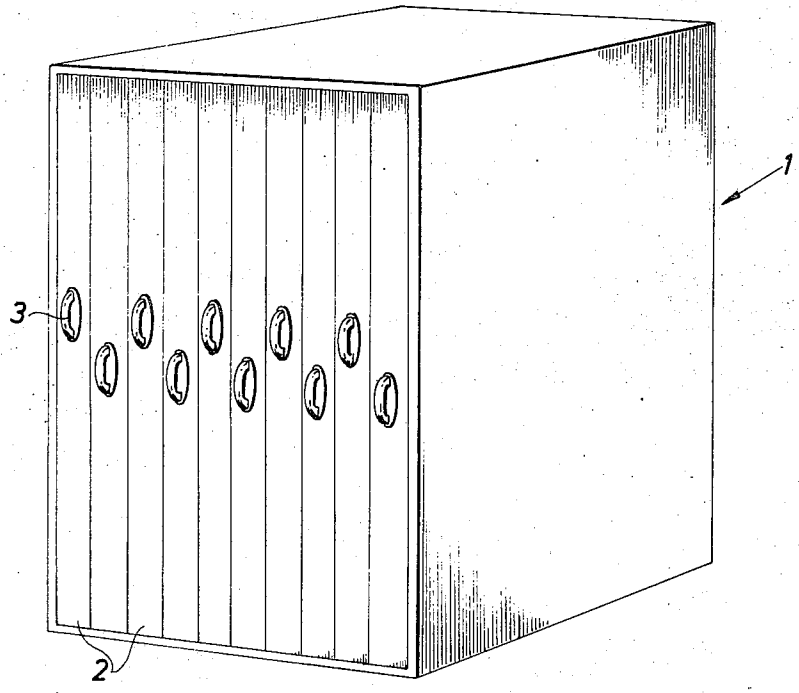


Fig.1

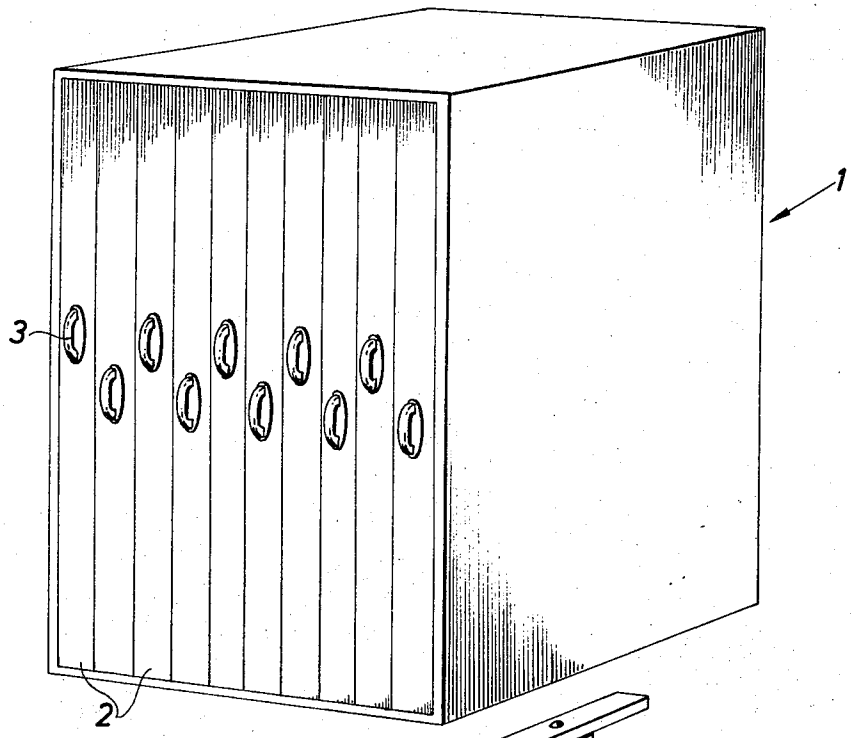


Fig.2

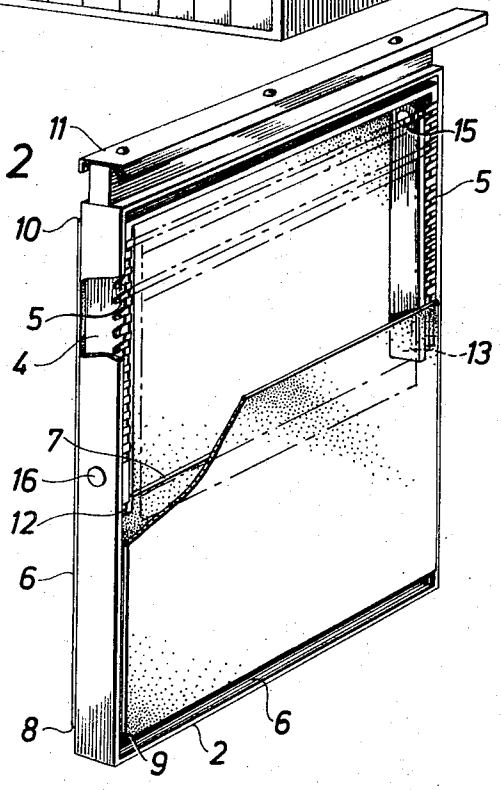


Fig. 3c

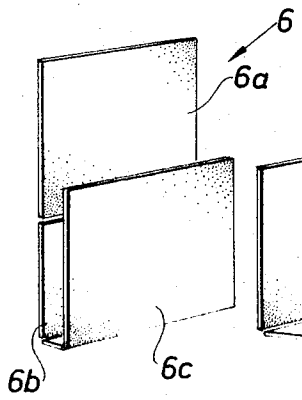


Fig. 3b

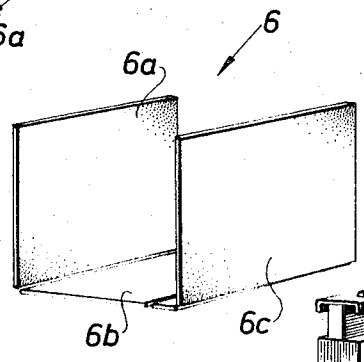


Fig. 3a

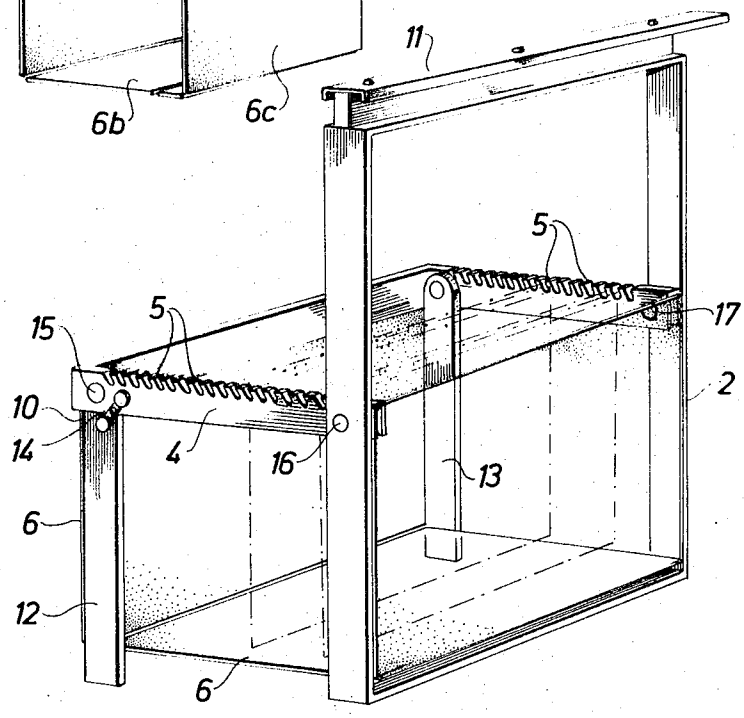


Fig. 4

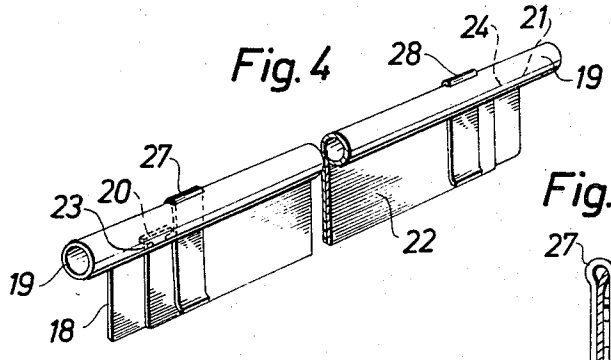


Fig. 5

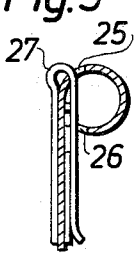


Fig. 6

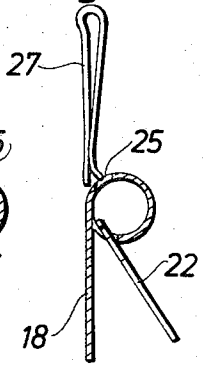


Fig.7

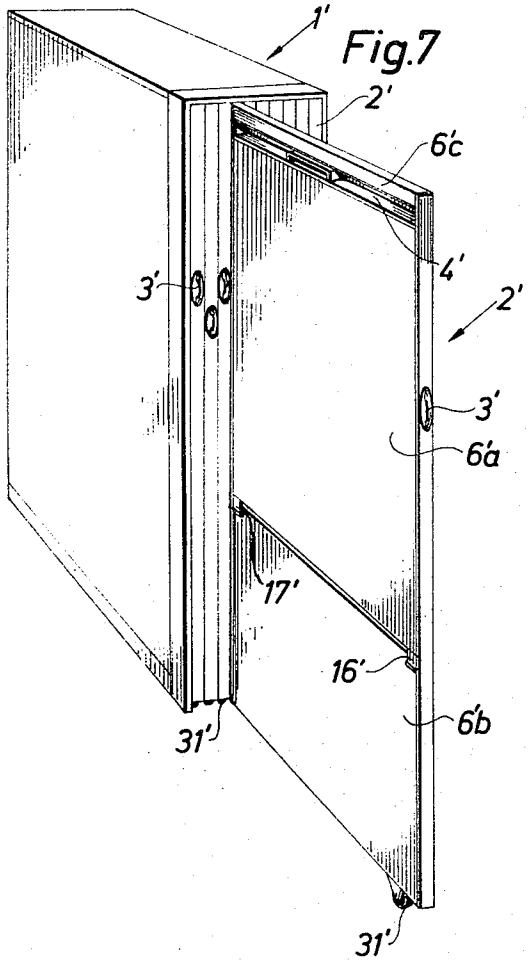


Fig.8

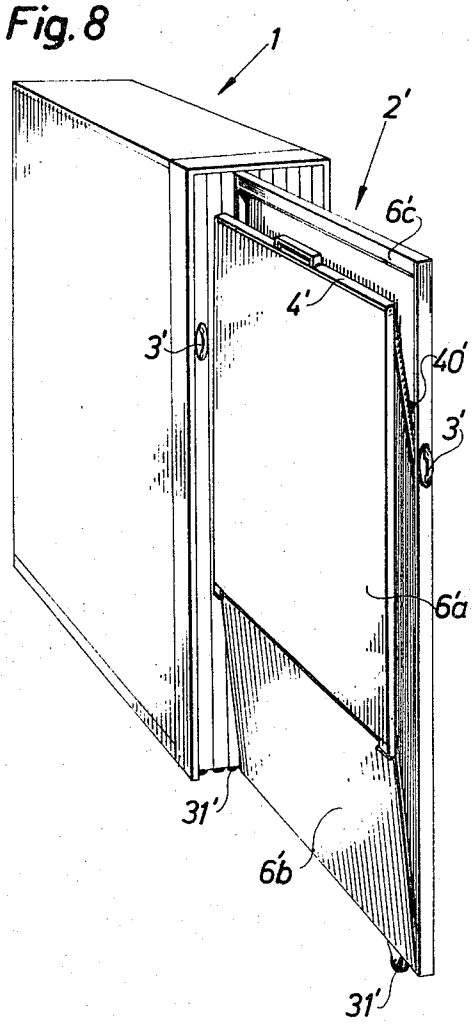


Fig. 9

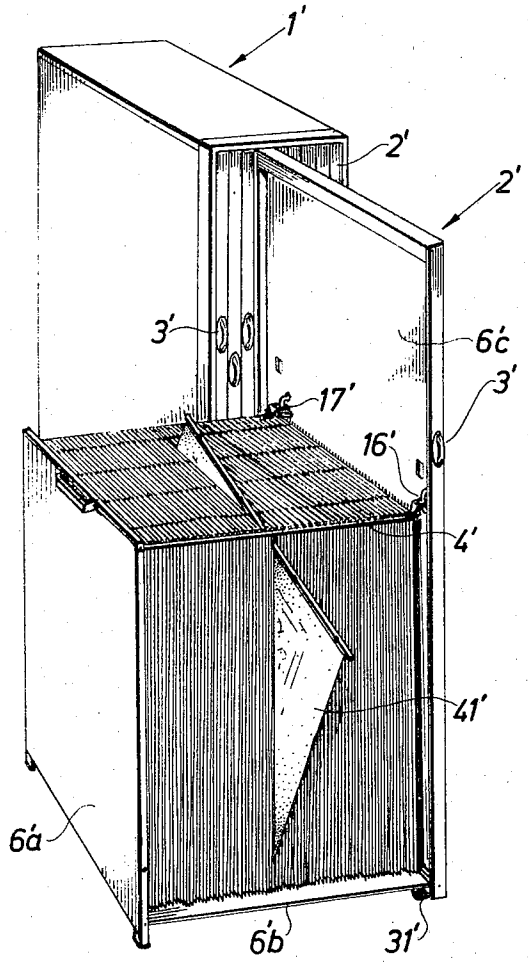


Fig. 10

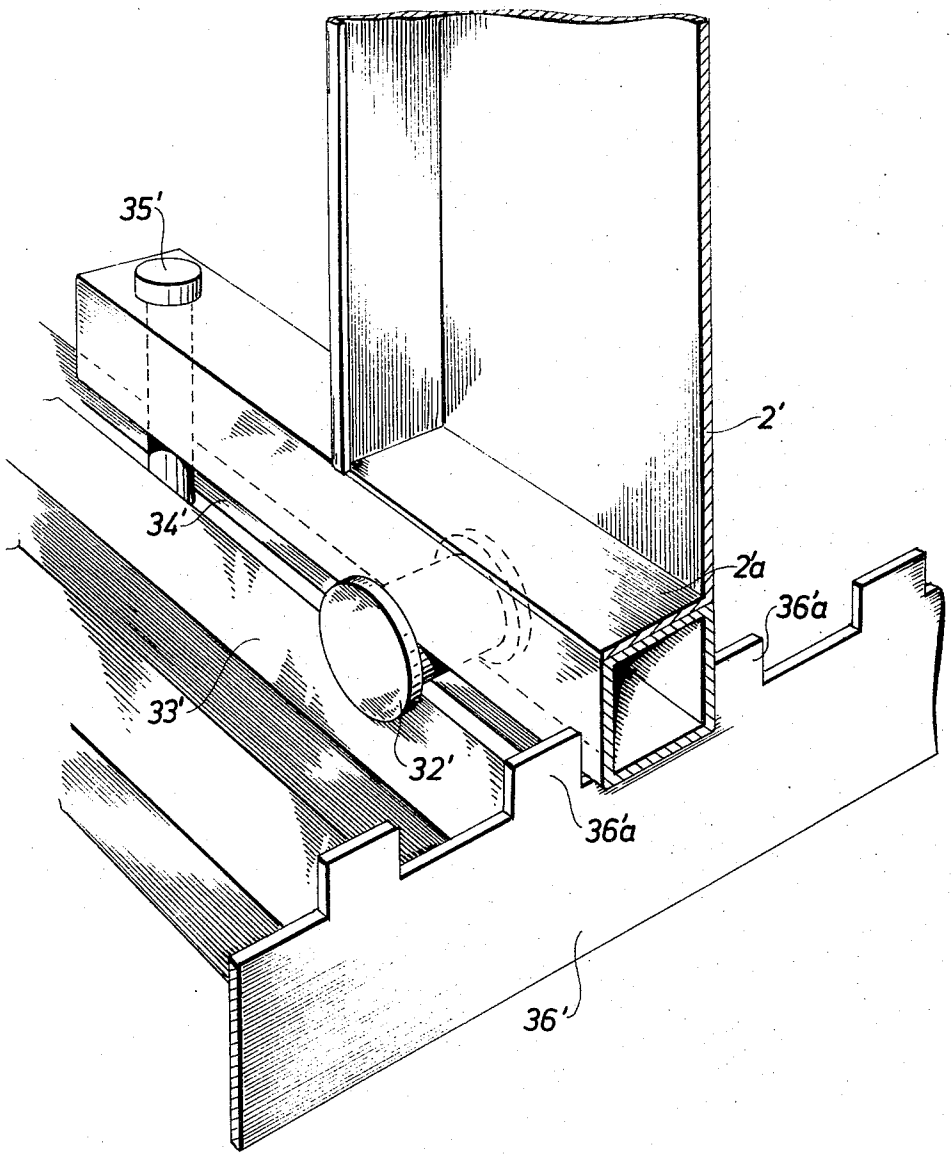
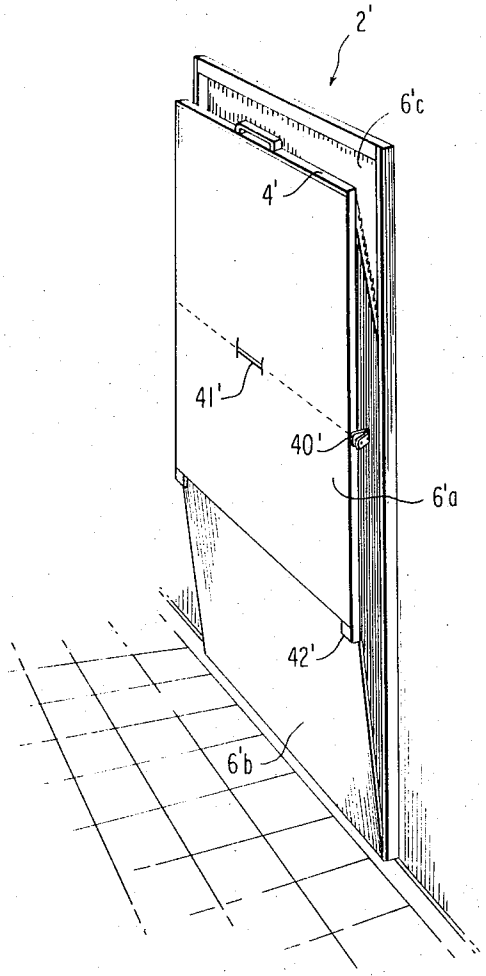


Fig. 11



FILING CABINET CONTAINING STORING FRAMES FOR SUSPENDED SHEETS

REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of application Ser. No. 183,152, filed Sept. 23, 1971, and now abandoned.

BACKGROUND OF THE INVENTION

In devices for filing or storing thin sheets such as constructional drawings, the problem is met that the stored sheets shall take as little space as possible while simultaneously the taking out and bringing back, respectively, of a certain sheet shall be easily permitted. Previously known filing and storing devices for thin sheet-like articles have as a rule been very bulky and have often not permitted sufficient protection of the sheets at the handling thereof. Some examples of such previously known cabinets are described in U.S. Pat. No. 1,381,907, French Pat. No. 1,067,725 and German Pat. No. 353,446. Each of said previously known cabinets comprise a pivotable storing frame which in some of the arrangements is also displaceable relative to the cabinet in a direction forming an angle of 90° with the pivot axis. Such a cabinet only contains one storing frame for the sheets and has, thus, a rather low storing capacity despite great space requirements.

SUMMARY OF THE INVENTION

A filing cabinet according to the present invention as defined in the attached claims avoids the above-mentioned drawbacks. In the filing position each storing frame containing for instance 50 suspended sheets, which may have a width of only a few centimeters and a filing cabinet comprising for instance 10 such frames, i.e., having a filing capacity of about 500 sheets, will have a total width of only about half a meter. When a sheet to be taken out the corresponding storing frame is displaced out of and cabinet and extended or folded open, easy handling of the desired sheet is granted.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages will appear from the detailed description given below of some embodiments of filing cabinets according to the invention. The description refers to the attached drawings in which:

FIG. **1** is a perspective view of a filing cabinet according to the invention comprising a number of displaceable storing frames;

FIG. **2** is a perspective view of a storing frame belonging to the filing cabinet according to FIG. **1**;

FIG. **3***a* is a perspective view and illustrates the storing frame according to FIG. **2** in an outwardly pivoted position of a pivotable frame part belonging thereto;

FIGS. **3***b* and **3***c* are perspective views illustrating the design of a protecting shield belonging to the storing frame shown in FIGS. **2** and **3***a* in an inwardly and an outwardly pivoted position, respectively;

FIG. **4** is a perspective view of a sheetholder, a number of said holders being insertable in a storing frame in the position shown in FIG. **3***a*;

FIG. **5** is a vertical section through the holder according to FIG. **4**;

FIG. **6** illustrates a holder according to FIG. **4** in a position for the attachment of a sheet;

FIG. **7** is a perspective view of a modified embodiment of a filing cabinet, one of its storing frames being displaced out of the cabinet;

FIG. **8** is a perspective view of the cabinet according to FIG. **7**, the outwardly displaced storing frame being in a partly collapsed position;

FIG. **9** is a perspective view in which the storing frame shown in FIG. **7** takes the fully extended horizontal position;

FIG. **10** is a perspective view of a detail of a bearing means for a storing frame belonging to a cabinet according to any of FIGS. **7–9**; and

FIG. **11** is a perspective view of another embodiment of a filing cabinet for mounting on a wall or desk, etc.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The different parts in the embodiment according to FIGS. **7–11** have been given the same numerals as the corresponding parts in the embodiment according to FIGS. **1–4** but have been provided with a prime-sign (′).

A filing cabinet **1** is intended for the storing of a great number of thin sheet-like articles such as drawings. The cabinet contains 10 adjacent storing frames **2** shaped like carriages each of which may be displaced out of the cabinet by means of a handle **3**. Each storing frame has an upper guide rail **11** which cooperates with bearing and supporting means in the upper portion of the cabinet. At one side the guide rail **11** projects from the body of the storing frame. In the displaced position of the storing frames, the projection portion of the guide rail is still within the cabinet where it cooperates with a suitable stop means (not shown) which prevents the frame from being withdrawn out of the cabinet.

At the middle of the vertical portion of the rectangular storing frame **2**, each frame part **4** is pivoted at **16, 17**, the pivot axis being parallel to the guide rail **11**. Each said frame part **4** has a number — for instance 50 — of pairs of opposite supports **5** for holders secured to the upper portion of the drawings. The supports comprise slits which are cut out at the upper edge of the pivotable frame part **4** and are directed in an oblique direction downwards and backwards. The supports **5** have a rounded bottom.

At the front edge of the pivotable frame part **4**, two supporting legs **12, 13** are journalled at **15**. Said legs are pivoted outwards when the frame portion is pivoted to the horizontal position and are retained by means of a detent mechanism **14** of suitable design.

Around the front, bottom, and rear side of each storing frame **2**, there is a protective shield **6** comprising three main parts **6***a*, **6***b*, **6***c* and having a number of folds **7, 8, 9, 10** therebetween. The shield is made from a material such as paper, plastics, a metal, or a woven material. The shield **6** coincides with the shape of the frame in the collapsed and outwardly pivoted position, respectively. The protective shield **6** is so formed that, in the vertical position of the pivotable frame part **4**, it tightens around the sheets therewithin, i.e., so that the frame does not have any projecting portions but without difficulty may be displaced into the cabinet. The protective shield **6** ensures then that the sheets will not be damaged during said operation. In the outwardly pivoted position of the frame shown in FIG. **3***a*, the protective shield **6** efficiently prevents damage to the

sheets, as might occur when a person uses the cabinet by taking out or bringing back one or more sheets stored therein.

When the protective shield **6** is made of a woven material, it may be provided with any suitable tightening device, such as elastic bands, (not shown) which adapt the shield to the actual shape of the frame when it is pivoted to the collapsed position.

One holder for sheets such as drawings insertable in the pivotable frame portion is shown in FIGS. **4–6.** The holder comprises a rear part **18** which emerges into a part **19** shaped like a pipe or a bulge, the outer portions of which are supported in the supports **5.** T-shaped slits **20, 21** are formed in part **19.** The slits **20, 21** accept a pivotable front piece **22** provided with pivotable hinge means **23, 24** shaped to correspond with the slits **20, 21.** Part **19** also has one or more slits **25, 26** for a corresponding number of clamping springs **27, 28** which are adapted to force the front part **22** against the rear part **18** after insertion of a drawing.

In FIG. **6,** the holder is shown in a position for insertion of a drawing with the front part **22** pivoted forwardly-upwardly from the rear part **18,** so that the sheet can be conveniently placed in position.

The distance between the supports **5** in the pivotable frame part **4** may suitably amount to about 10 mm, all holders then being within easy reach. The length of a pivotable frame part **4** which may contain 50 holders will then somewhat exceed half a meter. The width of the pivotable frame part **4** may suitably amount to about 3 cm, which means that the total horizontal space required for each sheet will only amount to about 0.6 mm in the storing position.

The pivotable frame part **4** may be shaped like a channel member, the supports **5** cut out in the vertical flange being directed inwards. In the bottom of the said channel member, a record of the different supports may be attached so that a desired sheet may be taken out easily and rapidly. Further, the sheet holders may be provided with a suspending means of suitable design or in one way or the other cooperate with a separate suspension device so that a sheet brought out can be suspended for observation.

Referring now to FIGS. **7–10, 1'** denotes a modified filing cabinet containing a number of adjacent storing frames **2'.** Instead of an upper guide rail **11,** as in the previous embodiment, each storing frame **2'** is at its bottom supported by outer and inner rollers **31', 32'.** The outer roller **31'** rolls on the floor whereas the inner roller **32'** rolls on a track at the bottom of the cabinet as will be described hereinbelow with reference to FIG. **10.**

Each storing frame **2'** has a pivotable frame part **4'** linked thereto at **16', 17'.**

In this embodiment a protective shield **6'** comprising three metal plates **6'*a*, 6'*b*,** and **6'*c*** is used. The bottom plate **6'*b*** is linked to the front plate **6'*a*** and the rear plate **6'*c*.** In addition to protecting the stored sheets **41',** the front plate **6'*a*** forms a support for the pivotable frame part **4'** so that no separate legs are necessary for the purpose.

The rear shield plate **6'*c*** extends all along the height of the storing frame. Accordingly, complete protection of the sheets **41'** is ensured in the vertical position of the pivotable frame part shown in FIG. **7,** i.e., there is no risk that any sheet shall become damaged when the frame **2'** is displaced into or out of the cabinet **1'.**

In the extended position of each storing frame **2',** a desired sheet **41'** may be brought out below its pivotable frame part **4'** as illustrated in FIG. **9.**

As mentioned above, each storing frame **2'** is displaceable into and out of the cabinet, respectively, by means of inner and outer rollers **31', 32'.** The inner roller arrangement is shown in FIG. **10.** A flanged roller **32'** rolls on a track comprising two spaced plates or rails **33', 34'.** The bottom **2'*a*** of the storing frame **2'** rests on the roller **32'.** A releasable pin **35'** positioned at the rear end of bottom portion **2'*a*** projects below the said roller **32'** so as to abut a transverse member **36'** having spaced projections **36'*a*** directed upwards. A stop and guide means for the storing frame is accordingly formed at the bottom of the cabinet. It is not possible to withdraw the storing frame out of the cabinet without releasing the pin **35'.**

When one storing frame **2'** is displaced relative to the cabinet, it is guided between two projections **36'*a*** and adjacent frames **2'.** The cabinet may instead or in addition contain separate compartments for each storing frame. Suitably disposed snap means **40'** holds the pivotable frame part **4'** releasably attached to the rest of its storing frame **2'** in the vertical position of the pivotable frame part **4'** as shown in FIG. **8.**

FIG. **11** illustrates another embodiment of the present invention similar to that shown in FIGS. **7–10.** In FIG. **11,** frame **2'** is mounted on a wall, table, or desk and may serve as a folding filing cabinet. The structure of frame **2'** is the same as is described with respect to FIGS. **7–9** except that rollers **31'** and the inner roller arrangement of FIG. **10** are not required. It may, however, be released from the wall and provided with a handle, roller and stop means of the kind disclosed in FIGS. **7–10** and used in a filing cabinet **1'** shown in the said figures when there is a need for a greater filing capacity. In the embodiment shown in FIG. **11,** when the frame part **4'** is in the down or open position (not shown, but the same as FIG. **9**), **4'** is supported by member **42'.** Frame **4'** is held in the up or closed position by means of latch **40'.**

The means for pivoting the frame parts **4, 4'** and displacing each frame **2, 2'** in parallel with the pivot axis of said pivot may be designed in different ways. Good storing capacity within a predetermined space and easy handling of the stored articles will be important features for all such embodiments. Further, a protective shield similar to any of the ones described above will reduce the risk that any of the stored articles shall become damaged.

I claim:

1. A filing cabinet for storing sheet-like articles in a suspended position, said cabinet comprising:

a. a housing;

b. a plurality of frame means movable relative to said housing having a first position within said housing and a second position outside of said housing;

c. a plurality of receiving means, each receiving means receiving a plurality of holding means secured to the upper portion of said articles, wherein each receiving means corresponds to one of said plurality of frame means; and

d. pivot means for coupling said receiving means to a corresponding one of said frame means, wherein said receiving means pivot between a perpendicular and parallel position with respect to said frame means, such that when said receiving means is in

said perpendicular position said articles are suspended a first predetermined distance apart parallel to said frame means, said holding means all lying in a single plane perpendicular to said frame means and when said receiving means is in said parallel position said articles are suspended a second predetermined distance apart said second predetermined distance being substantially negligible, said holding means all lying in the plane of said frame means.

2. A cabinet as claimed in claim 1 further including a protection shield means for holding said articles closely packed together when said receiving means is in said parallel position to avoid damage to said articles when said frame means is moved into said cabinet.

3. A cabinet as claimed in claim 2, wherein said protection shield means comprises at least three parts for the front, bottom and rear side of the frame, the bottom part being linked to the front and rear part, respectively.

4. A cabinet as claimed in claim 3, wherein the height of the rear shield part is approximately twice the height of the front shield part but less than the height of said cabinet.

5. A cabinet as claimed in claim 2, wherein said front part of said protecting shield forms a support leg for said receiving means in the perpendicular position thereof.

6. A cabinet as claimed in claim 1, further comprising roller means for each of said frame means, said roller means positioned at the bottom of said cabinet wherein said roller means comprises at least one outer roller engaging the floor and at least one inner roller engaging a track at the bottom of said cabinet.

7. A cabinet as claimed in claim 6, further comprising guide and stop means for each of said frame means for cooperating with said inner roller means.

8. A cabinet as claimed in claim 7, wherein said guide and stop means comprises a releasable pin disposed at the bottom of said frame means behind said inner roller so as to project downwardly between two spaced members forming said track, and a cross-member positioned at the front bottom portion of said cabinet and provided with abutments for said inner roller, said cross-member cooperating with said pin when engaged by said inner roller thereby preventing said frame means from being withdrawn from said cabinet.

9. A filing cabinet for storing sheet-like articles in a suspended position, said cabinet comprising:

a. frame means;

b. receiving means including a plurality of holding means adapted to be secured to the upper part of said articles;

c. pivot means at the inner end of said receiving means for coupling said receiving means to said frame means to permit said receiving means to pivot upwardly from a perpendicular to a parallel position with respect to said frame means, such that when said receiving means is in said perpendicular position, said articles are suspended a first predetermined distance apart parallel to said frame means, said holding means all lying in a single plane perpendicular to said frame means and, when said receiving means is in said parallel position, said articles are suspended a second predetermined distance apart, said second predetermined distance being substantially negligible, said holding means all lying in the plane of said frame means.

10. A cabinet as claimed in claim 9 and further comprising means for securing said frame means to a vertical surface.

11. A cabinet as claimed in claim 9 further including a protection shield means for holding said articles closely packed together when said receiving means is in said parallel position.

12. A cabinet as claimed in claim 11, wherein said protection shield means comprises at least three parts for the front, bottom, and rear side of said frame means, the bottom part being linked to the front and rear part, respectively.

13. A cabinet as claimed in claim 12, wherein the height of the rear shield part is approximately twice the height of the front shield part but less than the height of said cabinet.

14. A cabinet as claimed in claim 11, wherein said front part of said protecting shield forms a support leg for said receiving means in the perpendicular position thereof.

15. A filing cabinet for storing sheet-like articles in a suspended position, said cabinet comprising:

a. a frame having thereon first and second pivot points spaced from one another;

b. a first frame part pivoted at one end to said first pivot point;

c. a second frame part pivoted at one end to said second pivot point;

d. a first plurality of supports for holders for articles to be stored in said filing cabinet, said supports being located on and spaced a first predetermined distance apart on said first frame part;

e. a second plurality of supports for holders for articles to be stored in said filing cabinet, said second plurality of supports being located on said second frame part and spaced apart by said first predetermined distance,

whereby sheet-like articles suspended from said first and second frame parts will hang said first predetermined distance apart parallel to said frame when said frame parts are perpendicular to said frame and, when said frame parts are pivoted from a position perpendicular to said frame to a position parallel to said frame, sheet-like articles suspended from said first and second frame parts will hang a second predetermined distance apart parallel to said frame, said second predetermined distance being substantially negligible.

16. A filing cabinet as claimed in claim 15 and further comprising means for ensuring that said first and second frame parts pivot together.

17. A filing cabinet as claimed in claim 15 and further comprising means for releasably locking said first and second frame parts in position perpendicular to said frame.

18. A filing cabinet as claimed in claim 15 and further comprising means for releasably locking said first and second frame parts in position parallel to said frame.

19. A filing cabinet as claimed in claim 15 and further comprising means for securing said frame to a vertical surface.

20. A filing cabinet as claimed in claim 15 and further comprising shield means for holding sheet-like articles suspended from said first and second frame parts

closely packed together when said frame parts are parallel to said frame.

21. A filing cabinet as claimed in claim **20** wherein said shield means comprise:

a. a front part pivotably connected to said first and second frame parts at the end thereof remote from said frame;

b. a bottom part pivotably connected to said front part at the end thereof remote from said front part.

22. A filing cabinet as claimed in claim **21** wherein said front part is longer than the longest sheet-like article intended to be enclosed in said filing cabinet.

23. A filing cabinet as claimed in claim **21** wherein said shield means further comprises a rear part connected to said frame, said bottom part being pivotably connected to said rear part.

24. A filing cabinet as claimed in claim **21** wherein said front part forms a support leg for said first and second frame parts when said frame parts are positioned perpendicularly to said frame.

* * * * *