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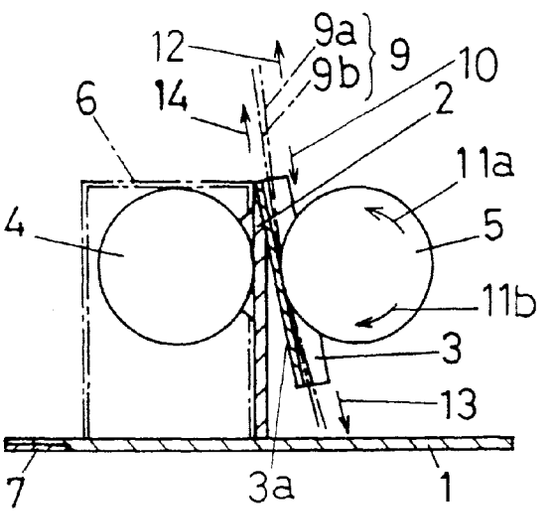
(54) Paper sheet holder

(57) This invention relates to a paper sheet holder comprising a base plate (1), a paper sheet guiding plate (3) made of non-magnetic material, which is arcuate as viewed in a top plan (upper direction), fixed in slant manner above the base plate, a permanent magnet (4) fixed at a convexed side surface of the paper sheet guiding plate, and a movable permanent magnet (5) movably and magnetically attracted by the curved outer wall surface at the concaved surface of the paper sheet guiding plate.

Further this invention provides a paper sheet holder comprising a base plate (25), a paper sheet guiding plate (26) made of non-magnetic material fixed in a slant manner above the base plate, a plurality of permanent magnets (27) embedded in the paper sheet guiding plate while being spaced apart by a predetermined distance in a horizontal direction, and a plurality of movable permanent magnets (30) spaced apart by a perdetermined distance in a horizontal direction movably and magnetically attracted by the curved outer wall surface to both side surfaces or one side surface of the paper sheet guiding plate,

FIG. 1



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to a paper sheet holder having as its object to make a vertical holding of the paper sheet and more particularly a paper sheet holder having as its object to make a vertical holding of the paper sheet under utilization of a magnetic attracting force of a permanent magnet.

Description of the Related Art

As a technology for making a vertical holding of a paper sheet, it is well known in the art to provide a device using a permanent magnet. This device is widely known as a combination of a ferromagnetic plate and a permanent magnet block, and used in a various kinds of forms. For example, there is a case in which a paper sheet is fixed to a bulletin board of iron plate with a permanent magnet block.

In addition, it is also known to provide a technology in which an upper end of a manuscript, a reference document or the like is held in a spring-type binder which can be placed on a desk so as to hold it.

In turn, it is also known to provide a technology in which a paper sheet having a specified strength printed with a menu or the like is fitted on a base material having a groove therein such as a menu stand placed on a table in a restaurant or the like so as to make a vertical holding of the sheet.

In the aforesaid conventional art utilizing a permanent magnet, the paper sheet was fixed by a permanent magnet block having its surface in parallel with a surface of the ferromagnetic plate, and a specified amount of contact area against a ferromagnetic plate, which has a larger area that of the paper sheet to be held. In the case that the paper sheet is to be held, the permanent magnet block is removed by one hand from the ferromagnetic plate while the paper sheet is being held by the other hand and subsequently the paper sheet is to be fixed against the ferromagnetic plate with the permanent magnet block while the paper sheet is being pushed against the ferromagnetic plate. In addition, in the case that the paper sheet is to be removed from the ferromagnetic plate, at first, the paper sheet is being held by the one hand while the permanent magnet block is to be removed from the ferromagnetic plate by the other hand, and then the paper sheet is to be removed from the ferromagnetic plate. That is, the vertical holding and removal of the paper sheet can not be carried out by one hand. Additionally, in the case that a plurality of paper sheets are held, pulling-out of only one required sheet of paper from their sheets and in turn insertion of only one sheet of paper to be added can not be carried out while the permanent magnet block is being magnetically attracted to the ferromagnetic plate, and also in this case an one-hand operation for the paper sheet removal or insertion can not be performed.

In addition, the technology utilizing the aforesaid conventional permanent magnet is operated such that the paper sheet is fixed by the permanent magnet to the ferromagnetic plate such as an iron plate having a larger size than that of the paper sheet to be held and so it has a problem that the holder became a hindrance item when the block is mounted on a desk.

Further, also in the case that a spring-type binder is utilized, it is difficult to pull out a manuscript or a reference document or the like with one hand and pulling-out or insertion of the document can not be carried out simply within a short period of time when a word processor and a type writer or the like are operated.

In turn, as found in the menu stand placed on a table in a restaurant or the like, the technology in which the paper sheet having a menu or the like printed on it and also having a specified strength is fitted on a base member having a groove and vertically held in it requires that the paper sheet has a specified strength, so that this technology has a problem in which a cost reduction is hardly carried out

SUMMARY OF THE INVENTION

This invention has solved the aforesaid prior art problem by arranging a permanent magnet at one side surface of a paper sheet guiding plate made of non-magnetic material fixed on a base member or embedding the permanent magnet within the paper sheet guiding plate, magnetically attracting a movable permanent magnet with contacting its curved outer wall surface to the other side surface of the paper sheet guiding plate, inserting or pulling out the paper sheet between the other side surface of the paper sheet guiding plate and the curved surface of the movable permanent magnet while the curved surface of the movable permanent magnet is being magnetically attracted to the other side surface of the paper sheet guiding plate.

In this case, there is no difference in actions and effects of the present invention even if any one of the fixed or embedded permanent magnet or the movable permanent magnet is composed of a ferromagnetic member.

In this case, a wording of "movable" in the movable permanent magnet and the movable ferromagnetic member described in the specification of the present invention is meant by the fact that either the permanent magnet or the ferromagnetic member can be magnetically attracted to the side surface of the paper sheet guiding plate or removed from it, and further either the permanent magnet or the ferromagnetic member can be freely slid in a vertical or a lateral direction on the side surface of the paper sheet guiding plate as well as it can be freely rotated on the side surface of the paper sheet guiding plate while the permanent magnet or ferromag-

netic member is attracted to the side surface of the paper sheet guiding plate.

Also, in this specification, a vertical holding of the paper sheet means not only to hold the paper sheet vertically but also to hold the paper sheet somewhat inclined to a vertical line such as inclined at 5° to 30° to a vertical line.

That is, the first paper sheet holder proposed by the present invention is comprised of a paper sheet guiding plate made of non-magnetic material fixed above a base plate, a permanent magnet fixed to one side surface of the paper sheet guiding plate or embedded in the paper sheet guiding plate and a movable permanent magnet or a movable ferromagnetic member movably and magnetically attracted to the other side surface of the paper sheet guiding plate.

Further, a second paper sheet holder proposed by the present invention is comprised of a paper sheet guiding plate made of non-magnetic material fixed above a base plate, a permanent magnet fixed to one side surface of the paper sheet guiding plate or embedded in the paper sheet guiding plate, a movable permanent magnet or a movable ferromagnetic member movably and magnetically attracted to the other side surface of the paper sheet guiding plate and a means arranged at the other side surface of the said paper sheet guiding plate for preventing either the movable permanent magnet or the movable ferromagnetic member from disengaging or dropping.

In the first paper sheet holder of the present invention, it is possible to cause the base plate to have a function to prevent the paper sheets and the movable permanent magnet from being dropped or disengaged in a vertical direction. That is, it is necessary to prevent the paper sheets and the movable permanent magnet from being dropped or disengaged in a vertical direction in the case that a sufficient magnetic attraction force can not be realized due to the large number of paper sheets to be held vertically and the increased thickness or in the case that the heavy paper sheets can not be supported only with the magnetic force or the like. In this case, the dropping and disengaging of the paper sheets in a vertical direction can be prevented under application of a predetenined width to the base plate.

In turn, if the structure for use in fixing the paper sheet guiding plate above the base plate in a slant direction is employed, it is possible to prevent the paper sheets and the movable permanent magnet from being dropped and disengaged by the inclination of the paper sheet guiding plate and the magnetic attracting force between the movable permanent magnet or the movable ferromagnetic member and the permanent magnet fixed to the rear side of the paper sheet guiding plate, so that the structure as described above is employed and it is not necessary to cause the base plate to have a function to prevent the paper sheet and the movable permanent magnet from being dropped and disengaged in a vertical direction.

In addition, in the second paper sheet holder of the present invention, since the side surface of the paper sheet guiding plate to which the movable permanent magnet or the movable ferromagnetic member is magnetically attracted is provided with a means for preventing the movable permanent magnet and the movable ferromagnetic member from being disengaged, it is not necessary to give a special consideration on the base member preventing the paper sheets from dropping or disengaging or to make a slant arrangement of the paper sheet guiding plate on the base member.

In the first and the second paper sheet holders of the present invention, if the paper sheet guiding plate is formed into an arcuate shape into which either the movable permanent magnet or the movable ferromagnetic member is attracted, the paper sheet can be held vertically even if the paper sheet guiding plate having a quite smaller area than an area of the paper sheet to be held is applied. If the arcuate paper sheet guiding plate curved at a rear side of the paper sheet guiding plate as viewed from its top plan (upper direction) is applied, the paper sheet can be curved along with the said curved surface of the guiding plate and held vertically.

A similar action and a similar effect can be attained by making the side surface where either the movable permanent magnet or the movable ferromagnetic member is magnetically attracted into a corrugated surface. However, in this case, an increased clearance between the permanent magnet fixed on the rear side of guiding plate and either the movable permanent magnet or the movable ferromagnetic member causes the magnetic attracting force to be decreased, so that this state requires a certain attention.

Even in the case that the paper sheet guiding plate is not formed into an arcuate shape as described above, i.e. in the case that a flat paper sheet guiding plate is used, arrangement of supporting members supporting the paper sheet while being curved at lateral right and left sides of the paper sheet guiding plate enables the paper sheet to be held vertically in the same manner by the paper sheet guiding plate having a quite smaller area than an area of the paper sheet to be held.

That is, under an arrangement in which the paper sheet guiding plate is formed into an arcuate having a concave surface, viewed from its top plan, to which the movable permanent magnet or the like is magnetically attracted, the paper sheet guiding plate is fixed in a slant orientation above the base plate and the disengaging preventive means of horizontal projecting state for the paper sheets and the movable permanent magnet or the like is arranged at a lower end of the paper sheet guiding plate, the paper sheets having a far larger area than an area of the paper sheet guiding plate can be held vertically along an inclination angle of the paper sheet guiding plate and curved along the concave surface of guiding plate while its dropping and disengaging are being prevented.

In the first and the second paper sheet holders of

the present invention, it is preferable that either the movable permanent magnet or the movable ferromagonetic member is formed into a shape contacting with the paper sheet guiding plate by the curved outer wall surface such as a disk-shape, a spherical shape, an ellipse spherical shape, a semi-disk shape, a semi-sphere shape, a semi-ellipse sphere shape, or either a column like shape or a cylindrical shape having a circular section or an ellipse section. Forming of its shape into such shapes as before described, an area of either the movable permanent magnet or the movable ferromagnetic member contacted with the side surface of the paper sheet guiding plate becomes quite small. As a result, a resistance between the movable permanent magnet, the movable ferromagnetic member and the side surface of the paper sheet guiding plate is also reduced, so that the movable permanent magnet and the movable ferromagnetic member can be freely slid on the side surface of the paper sheet guiding plate in a vertical or a lateral direction as well as freely rotate on the side surface irrespective of the fact that they are forcedly attracted to the side surface of the paper sheet guiding plate with a magnetic force between it and the permanent magnet at the rear side of the paper sheet guiding plate.

With such an arrangement as above, it becomes possible to perform an easy insertion or an easy pulling-out of the paper sheet between the paper sheet guiding plate and the movable permanent magnet or the like, while either the movable permanent magnet or the movable ferromagnetic member is being magnetically attracted to the paper sheet guiding plate and it has become possible to hold or remove the paper sheet with one hand.

In addition to the arrangement in which either the movable permanent magnet or the movable ferromagnetic member itself is formed into such a shape as one contacting with the paper sheet guiding plate by the curved outer wall surface, it is possible to construct either the movable permanent magnet or the movable ferromagnetic member as follows. That is, it is possible to make an arrangement in which either the movable permanent magnet or the movable ferromagnetic member is formed by any one of spherical, semi-spherical, ellipse spherical or semi-ellipse spherical shapes made of non-magnetic material having either the permanent magnet or the ferromagnetic member piece within it, or an arrangement in which either the permanent magnet piece or the ferromagnetic member piece is movablely filled in any one of hollow sphere, hollow semi-sphere, hollow ellipse sphere or hollow semi-ellipse sphere made of non-mgnetic material. Under all these arrangements, the part where either the movable permanent magnet or the movable ferromagnetic member is contacted with the side surface of the paper sheet guiding plate has a curved shape, and further it is possible to utilize a magnetic attracting force between it and the permanent magnet fixed to rear side surface of the paper sheet guiding plate or embedded in the paper sheet guiding plate. As described above, it is also possible to perform an easy insertion of the paper sheet between them or pulling it out of them while either the movable permanent magnet or the movable ferromagnetic member is being magnetically attracted to the paper sheet guiding plate.

With the foregoing arrangement, in the case the permanent magnet is fixed on the rear side of paper sheet guiding plate and the permanent magnet piece is placed in the sphere, a semi-sphere, an ellipse sphere or semi-ellipse sphere made of solid non-magnetic material, if the permanent magnet piece is eccentrically placed in it, it becomes possible to make an adjustment in which the curved outer wall surface always contacts with the side surface of the paper sheet guiding plate, and adjust a magnetic attracting force between the permanent magnet fixed on the rear side of paper sheet guiding plate and the permanent magnet piece,

In addition, it becomes also possible to construct either the movable permanent magnet or the movable ferromagnetic member by making a part of the outer wall surface in the solid sphere of non-magnetic material with either the permanent magnet piece or the ferromagnetic member piece.

In turn, in the case that in particular the permanent magnet piece is eccentrically placed in the solid sphere member or the like and one which is fixed to rear side surface of the paper sheet guiding plate or which is embedded in the paper sheet guiding plate is also a permanent magnet in such a configuration as above, it is necessary to consider the fixing, embedding of the permanent magnet at the side of the paper sheet guiding plate or arrangement of the permanent magnet piece in the movable permanent magnet in reference to their relative polarities, i.e. their attracting directions, resulting in that inconvenience of troublesome assembling work for the product is produced.

In the case that the permanent magnet piece is filled in the hollow sphere or the like in such a manner that it may be freely moved to construct a movable permanent magnet, such an inconvenience as above may not occur. That is, when the permanent magnet piece is attracted to the permanent magnet at the rear side of the paper sheet guiding plate, the permanent magnet capable of being freely moved within the hollow sphere may arrange its attitude in such a direction in which the magnet can attract it.

In the foregoing arrangement, although it has been employed to provide a configuration in which the permanent magnet is fixed to one (rear) side surface of the paper sheet guiding plate made of non-magnetic material and either the movable permanent magnet or the movable ferromagnetic member is magnetically and movably attracted at the other (front) side surface of the paper sheet guiding plate, and in opposition to the above, it is also possible to fix the ferromagnetic member to one (rear) side surface of the paper sheet guiding plate made of non-magnetic material or embed the fer-

romagnetic member in the paper sheet guiding plate and employ a configuration in which the movable permanent magnet is movably and magnetically attracted to the other (front) side surface of the paper sheet guiding plate.

A third paper sheet holder proposed by the present invention is comprised of a paper sheet guiding plate made of non-magnetic material arranged in an inclined manner above a base plate, a plurality of permanent magnets spaced apart by a predetermined distance in a horizontal direction and embedded in the paper sheet guiding plate, and a plurality of movable permanent magnets or movable ferromagnetic members spaced apart by a predetermined distance in a horizontal direction and movably and magnetically attracted to both side surfaces or one side surface of the paper sheet guiding plate.

In this case, either the movable permanent magnet or the movable ferromagnetic member is set to have a shape contacted with the paper sheet guiding plate by a curved outer wall surface, such as a column-like member or a cylindrical member having circular section or an ellipse section. A reason why a shape of the part of either the movable permanent magnet or the movable ferromagnetic member contacted with the paper sheet guiding plate is set as a curved surface is similar to those of the aforesaid first and second paper sheet holders of the present invention.

Accordingly, in addition to the configuration in which the shapes of the movable permanent magnet and the movable ferromagnetic member are set, it is also possible to constitute either the movable permanent magnet or the movable ferromagnetic member by the column-like members of non-magnetic material of circular section or ellipse section with a plurality of permanent magnets or ferromagnetic member pieces spaced apart by a predetermined distance within it or to constitute by freely filling either the permanent magnet pieces or the ferromagnetic member pieces for every sections of the hollow cylinders of non-magnetic material of circular section or ellipse section partitioned into a plurality of segments in a longitudinal direction.

In this paper sheet holder, a plurality of permanent magnets are spaced apart by a predetermined distance in a horizontal direction in the paper sheet guiding plate, and a plurality of movable permanent magnets magnetically attracted to the paper sheet guiding plate are also spaced apart correspondingly by a predetermined distance, so that the paper sheet can be held vertically by the movable permanent magnets or the like having a predetermined length in the horizontal direction. Since magnetic forces between a plurality of permanent magnets in the paper sheet guiding plate and a plurality of movable permanent magnets or the like are utilized, this third paper sheet holder is effective for vertically holding the paper sheet having a more thickness and a heavier weight than those of the first and the second paper sheet holders. In this paper sheet holder, the base plate may act to prevent the paper sheet and the movable permanent magnets or the like from being dropped or disengaged in a vertical direction.

In this case, similar to the first and the second paper sheet holders of the present invention, the members embedded in the paper sheet guiding plate made of non-magnetic material may be altered to a plurality of ferromagnetic members, so that a plurality of movable permanent magnets which are spaced apart by a predetermined distance in a horizontal direction and movably and magnetically attracted to both side surfaces or one side surface of the paper sheet guiding plate may also be applied.

According to the present invention, there may be provided some effects that it is possible to hold the paper sheet accurately in vertical direction irrespective of the number of paper sheets and the insertion and removing of the paper sheets can be performed simply and easily by one hand.

In addition, since the movable permanent magnets and the fixed permanent magnets keep their relative positions under an attraction of their magnetic forces, there is no possibility that a certain trouble may occur differing from the case in which a fixing piece or the like is present.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a side elevational view in longitudinal section for showing a paper sheet holder of the preferred embodiment of the present invention.

Fig. 2 is a front elevational view for showing the paper sheet holder shown in Fig. 1.

Fig. 3 is a top plan view of the paper sheet holder shown in Fig. 1.

Fig. 4 is a sectional view for showing the preferred embodiment of a movable permanent magnet used in the present invention.

Fig. 5 is a sectional view for showing another preferred embodiment of the movable permanent magnet used in the present invention.

Fig. 6 is a sectional view for showing a still further preferred embodiment of the movable permanent magnet used in the present invention.

Fig. 7 is a side elevational view in longitudinal section for showing the paper sheet holder of the present invention using the movable permanent magnet shown in Fig. 6.

Fig. 8 is a side elevational view in longitudinal section of the paper sheet holder of another preferred embodiment of the present invention.

Fig. 9 is a side elevational view in longitudinal section for showing a state in which many paper sheets are held in the paper sheet holder shown in Fig 8.

Fig. 10 is a top plan view for showing the paper sheet holder of the present invention provided with the paper supporting member.

Fig. 11 is a side elevational view with a part of the

paper sheet holder shown in Fig. 10 being cut away.

Fig. 12 is a top plan view for showing another paper sheet holder of the present invention provided with the paper sheet supporting member.

Fig. 13 is a side elevational view with a part of the paper sheet holder shown in Fig. 12 being cut away.

Fig. 14 is a cross sectional view for showing an example of use in which the paper sheet holder of the present invention is fixed to a vertical wall.

Fig. 15 is a perspective view for showing another paper sheet holder of the present invention.

Fig 16 is a sectional view taken along a line A-A of Fig. 15.

Fig 17 is a perspective view for showing a still further paper sheet holder of the present invention.

Fig. 18 is a sectional view taken along a line B-B of Fig. 17.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(Embodiment 1)

Referring now to Figs. 1, 2 and 3, one preferred embodiment of the present invention will be described as follows.

A supporting plate 2 is mounted vertically at a base plate 1 made of non-magnetic material such as synthetic resin, a paper sheet guiding plate 3 made of non-magnetic material such as synthetic resin is fixed to the supporting plate 2 in an inclided state. The paper sheet guiding plate 3 is formed in a concave arcuate shape as viewed in its top plan.

A disc-like permanent magnet 4 is fixed to the supporting plate 2 positioned at a side of a convex surface 3a of the paper sheet guiding plate 3 and then a movable permanent magnet 5 is contacted with and magnetically attracted to a concave surface 3b of the paper sheet guiding plate 3. Reference numeral 6 in Fig. 1 and Fig. 3 denotes a cover for the permanent magnet 4. A permanent magnet piece 7 for fixing a paper sheet holder to a wall surface or the like is fixed to one side of the base plate 1.

Although the movable permanent magnet 5 is of a disc-like shape, it is embedded in a sphere 8 made of transparent synthetic resin, resulting in that its entire outer shape is a sphere shown in Fig. 2.

In the aforesaid preferred embodiment, when a paper sheet 9 is pushed into the paper sheet holder as indicated by an arrow 10, the sphere 8 including a disk-like shape permanent magnet 5 is rotated in a direction indicated by an arrow 11a, and the paper sheet 9 can be easily inserted into the paper sheet holder. When the paper sheet 9 is pulled in a direction indicated by an arrow 12, the sphere 8 including a disk-like shape permanent magnet 5 is rotated in a direction indicated by an arrow 11b, and easily removed from the paper sheet holder.

In the foregoing, as a weight of the sphere 8 including a disk-like shape permanent magnet 5 is increased more than a magnetic attracting force between the permanent magnets 4 and (for example, in the case that the number of paper sheets is increased), the sphere 8 drops together with the paper sheets 9 as indicated by an arrow 13, resulting in that the paper sheets 9 can not be pushed and held by the sphere 8 including a disk-like shape permanent magnet 5. In view of this fact, the paper sheet guiding plate 3 is slanted (for example, slanted by 10°) so as to reduce a dropping partial form of the sphere to enable the sphere 8 to be automatically returned back along the paper sheet guiding plate 3.

In this embodiment, even if a plurality of paper sheets 9 are pushed by the sphere 8 and held in the paper sheet holder, the paper sheet 9a at the most-forward location has a relative low frictional force (due to rotation of the sphere 8 including a disk-like shape permanent magnet 5), so that even if the paper sheet 9a is pulled up as indicated by an arrow 14, a paper sheet 9b placed at a next location keeps its present position. That is, even in the case that only one paper sheet is pulled out of a plurality of paper sheets held in a vertical orientation or even in the case that a new one paper sheet is inserted into a plurality of held sheets, it is not necessary to remove intentionally the sphere 8 including a disk-like shape permanent magnet 5 from the paper sheet guiding plate 3.

In this embodiment, a disc-like movable permanent magnet is used as the movable permanent magnet 5 as illustrated in Figs. 1, 2 and 3. In this case, as shown in Figs. 1 and 3, a disc-like permanent magnet is used as a permanent magnet 4 and fixed vertically to a rear surface side of the paper sheet guiding plate 3. If the disc-like permanent magnet 4 is not fixed vertically to a rear surface of the supporting plate 2 as shown in Fig. 1, a magnetic attracting force acting between the permanent magnet 4 and the disk-like permanent magnet 5 is not effectively applied, so that a certain attention is required for the arrangement. This condition is required for a case in which the permanent magnet is fixed to the paper sheet guiding plate, the permanent magnet is also applied at a side pressing the paper sheet, and both permanent magnets are of a disc-like shape.

For example, in the case that the member to be fixed to the rear side of the paper sheet guiding plate is a ferromagnetic member such as an iron plate, even if the movable permanent magnet 5 is of a disc-like shape, it is satisfactory that a rectangular ferromagnetic member is applied to be fixed to a rear surface side of the paper sheet guiding plate 3.

In the case that the permanent magnet of spherical or semi-spherical shape as shown in Figs. 4, 5, or 6 is used as the movable permanent magnet 5, it is satisfactory that a rectangular permanent magnet or a rectangular ferromagnetic member is applied to be fixed to a rear surface side of the paper sheet guiding plate 3.

The movable permanent magnet 5 shown in Fig. 4

is one in which a permanent magnet 5b is embedded in a sphere 5a of non-magnetic material. The movable permanent magnet 5 shown in Fig. 5 is one in which a permanent magnet 5b is embedded in a semi-sphere 5a made of non-magnetic material. If the permanent magnet 5b is eccentrically present as shown in Fig. 5, it is always possible to contact the curved spherical surface 5c with the paper sheet guiding plate 3. The movable permanent magnet 5 shown in Fig. 6 is one in which a permanent magnet piece 5b is movably filled in the hollow sphere 5a made of non-magnetic material.

Fig. 7 illustrates a case in which the paper sheet 9 is held with the movable permanent magnet 5 shown in Fig 6. The permanent magnet piece 5b is freely moved in the hollow sphere 5a, applies an attracting force in compliance with a polarity of the permanent magnet 4 at the side of the paper sheet guiding plate 3 so as to hold the paper sheet 9. In the example shown in Fig. 7, the paper sheet guiding plate 3 is comprised of a flat surface 3a and a rear part 3b constituting its rear side, wherein the permanent magnet 4 is embedded in the rear part 3b. It is also possible to make the rear part 3b into a shape of character goods or various shapes of ornament so as to enjoy their visual appearances. It is also possible to fill a bell in the hollow movable permanent magnet 5 shown in Fig. 6 together with the permanent magnet piece 5b, to generate sound from it and to enjoy its sound.

A shape and a configuration of the movable permanent magnet 5 are not limited to those shown in Figs. 1 to 3, 4, 5 and 6, and if its shape is one in which it is contacted with the paper shed guiding plate by and trough its curved outer wall surface, various configurations may be employed for example, the permanent magnet itself is made into a disc-like shape, a sphere, an ellipse sphere, a semi-disc shape, a semi-sphere, a semi-ellipse sphere or a column-like member, a cylindrical member having a circular section or an ellipse section as well as the permanent magnet piece is embedded in the sphere or the like or the permanent magnet is movably filled in the hollow sphere or the like.

The paper sheet guiding plate 3 may be formed into a flat configuration as shown in Fig. 7 as well and may be formed into an arcuate shape as shown in Figs, 1 to 3 in which its side surface magnetically attracted with the movable permanent magnet 5 is concaved. It is more preferable to apply the arcuate-shaped paper sheet guiding plate 3 as shown in Figs, 1 to 3 in order to make a vertical holding of the paper sheet 9 having a larger area than that of the paper sheet guiding plate 3.

In the foregoing description, the permanent magnet 4 is fixed to the paper sheet guiding plate 3 and a permanent magnet is also used as the movable permanent magnet 5, it is also possible to construct either one of them with a ferromagnetic member such as iron. However, it is preferable that both of them are of permanent magnets in order to make a vertical holding of the paper sheets with a specified thickness and weight in view of a magnetic force.

(Embodiment 2)

Referring to Figs. 8 and 9, a preferred embodiment 2 of the present invention will be described as follows.

A paper sheet guiding plate 3 made of non-magnetic material (for example, synthetic resin) having an arcuate shape as viewed from its top plan (an upper direction) is fixed to the base plate 1 made of non-magnetic material (for example, synthetic resin), a permanent magnet 4 is fixed to a convex surface 3a of the paper sheet guiding plate 3, and the movable permanent magnet 5 is slidably and rotatably contacted with the concave surface 3b and magnetically attracted to it. In this embodiment as the movable permanent magnet 5, a spherical permanent magnet is used

This embodiment 2 is different from the embodiment 1 shown in Figs. 1 to 3 in that a receiving plate 15 is arranged below the paper sheet guiding plate 3. In the case that the number of the paper sheets 9 to be held is increased or the weight of the paper sheets 9 to be held is heavy, there is a possibility that a magnetic force between the permanent magnet 4 and the movable permanent magnet 5 becomes insufficient, so that the paper sheets 9 drop in a downward direction and along with the plate 3, and the movable permanent magnet 5 may also be disengaged and dropped. However, the receiving plate 15 may act to prevent this state. The receiving plate 15 may receive the bottom end of paper sheets 9 and permanent magnet 5 as shown in Fig. 9. Fig. 9 illustrates the state in which the movable permanent magnet 5 is slid to the lower-most location and supported by receiving plate 15.

Since a relation between the paper sheet 9 and the movable permanent magnet 5 in this embodiment 2 is similar to that in the aforesaid embodiment 1, its detailed description has been eliminated.

(Embodiment 3)

A preferred embodiment shown in Figs. 10 and 11 is one in which a flat plate-like paper sheet guiding plate is used in place of the curved paper sheet guiding plate in the aforesaid embodiments 1 and 2. That is, a paper sheet guiding plate 17 made of synthetic resin is fixed in a slant manner to the base plate 1 made of non-magnetic material, arm levers 18, 18 are projected in a lateral direction and in a forward direction (the movable permanent magnet side) from the intermediate edge of the paper sheet guiding plate 17, and then guiding spheres 19, 19 are fixed to the extremity ends of the arm levers 18, 18, wherein the paper sheet 9 is curved and supported by the paper sheet guiding plate 17 and the guiding spheres 19, 19.

With such an arrangement as above, even if the flat-plate like paper sheet guiding plate 17 is applied, it is possible to make an easy vertical holding of the paper

sheet having a larger area than that of the paper sheet guiding plate 17.

Since its method of using in this embodiment is similar to that of the embodiment 1, its description is eliminated.

(Embodiment 4)

A preferred embodiment shown in Figs, 12 and 13 is constructed such that supporting levers 20, 20 are vertically mounted on the base plate 1 in place of the arm levers 18, 18 of the embodiment 3. Guiding spheres 21, 21 are fixed to the upper ends of the supporting levers 20, 20, and the paper sheet 9 is curved and supported in the same manner as that of the embodiment 3.

(Example of Application)

Fig. 14 shows an example of application (use) in which the paper sheet holder of the present invention is fixed to a vertical wall and used there. Although the paper sheet holder of the present invention is normally mounted on a desk and used there, it may also be magnetically attracted to a vertical wall and used there. In this case, since the base plate 1 is constructed in such a state in which it may be easily magnetically attracted to the wall, its example of application is shown.

That is, the permanent magnets 22 for use in magnetically fixing the paper sheet holder to a wall 24 are fixed to a rear surface of the base plate 1 made of synthetic resin, the permanent magnet 4 is fixed to a cover plate 23 fixed to the base plate 1 and then the paper sheet 9 is held by and between the movable permanent magnet 5 and the paper sheet guiding plate 3.

(Embodiment 5)

The preferred embodiment shown in Figs. 15 to 18 provides a paper sheet holder which is suitable for making a vertical holding of a paper sheet having a specified weight and a specified thickness as found in a menu stand.

The paper sheet guiding plate 26 made of non-magnetic material (such as synthetic resin) is fixed on the base plate 25 made of non-magnetic material (such as synthetic resin). As shown in the figure, it is preferable that the paper sheet guiding plate 26 is slanted by a specified angle, such as about 5° to 30° , and fixed on the base plate 25. This is applied in reference to the weight and thickness of the menu, etc. to b held.

Permanent magnets 27, 27 are spaced apart by a predetermined distance in a horizontal direction and embedded within the paper sheed guiding plate 26. Permanent magnets 30a, 30b are spaced apart in the same distance between the permanent magnets 27, 27 in the paper sheet guiding plate 26 and embedded in the column-like member 28. In turn, a hollow cylindrical member 29 is constructed such that permanent magnet pieces 33a, 33b are filled in the cavities 32a, 32b partitioned by a partition 31. With such an arrangement as above, both column-like member 28 and the hollow cylindrical member 29 are magnetically attracted at both sides of the paper sheet guiding plate 26 as indicated by arrows 34, 35.

In the foregoing, a space for embedding the permanent magnets 27, 27 is defined in response to a size and weight of the paper sheet to be vertically held. Fig. 15 illustrates a case in which two permanent magnets are embedded, three or four permanent magnets can be embedded in a desired space according to a size and weight of the paper sheet to be vertically held. It is necessary that a space between the permanent magnets embedded in the column-like member 28 or the like is corresponded to a space between the permanent magnets 27, 27 embedded in the paper sheet guiding plate 26.

As shown in Fig. 16, when the paper sheet 36 having a specified weight and a specified thickness as found in a menu in a restaurant is inserted as indicated by an arrow 37 under a state in which the column-like menber 28 and the cylindrical member 29 are magnetically contacted with to the paper sheet guiding plate 26, the column-like member 28 is rotated as indicated by an arrow 39 to hold the paper sheet 36 between it and the paper sheet guiding plate 26 and then the paper sheet 30 is vertically held by magnetic force between the permanent magnet 27, 27 and 30a, 30b. In turn, as the paper sheet 36 is pulled out as indicated by an arrow 40, the column-like member 28 is rotated as indicated by an arrow 41 and so it is possible to pull out the paper sheet 36 without requiring any work such as one to remove the column-like member 28 from the paper sheet guiding plate 26 with the other hand.

In Figs. 15 and 16, the column-like member 28 and the hollow cylindrical member 29 both made of non-magnetic material such as synthetic resin are illustrated as an example of each of the movable permanent magnet and the movable ferromagnetic member. However, it is also possible to insert the paper sheet 36 to make its vertical holding state and to pull it out without removing the movable permanent magnet or the like from the paper sheet guiding plate 26 if the movable permanent magnet or the like can freely slide on the surface of the paper sheet guiding plate and rotate on it. That is, if the movable permanent magnet and the movable ferromagnetic member have such a shape as contacting with the paper sheet guiding plate 26 at the curved outer wall surface, it is also possible to construct either the permanant magnet or the ferromagnetic member by itself into a column-like member or the like in addition to the column-like member 28 and the hollow cylindrical member 29 shown in Fig. 15 as a movable permanent magnet or the like. However, in the case that the permanent magnet is filled in the hollow cylindrical member, it is necessary to arrange a partition at the middle part so as not to cause a plurality of permanent magnets to be at-

tracted from each other.

In the examples shown in Figs. 15 and 16, each of two permanent magnets is applied (a total of four) and one of them is embedded near each of the wall surfaces of the paper sheet guiding plate 26. However, it is also possible to apply two large-sized permanent magnets capable of approaching up to near both side surfaces of the paper sheet guiding plate 26 and to embed them in the plate 26 while being spaced apart by a predetermined distance.

Figs. 17 and 18 illustrate a preferred embodiment in which disc-like permanent magnets 42, 42 are embedded in the paper sheet guiding plate 26 while being spaced apart in a horizontal and the disc-like permanent magnets 44, 44 are embedded also in the column-like member 43 while being spaced apart by a predetermined distance in a horizontal direction. This method of application is the same as that shown in Figs. 15 and 16, so that its description is eliminated.

Also in this embodiment, it is possible to apply not only a combination in which the member to be embedded in the paper sheet guiding plate 26 is a permanent magnet and a movable member magnetically attracted to the paper sheet guiding plate 26 is either a permanent magnet or a ferromagnetic member, but also a combination in which one embedded in the paper sheet guiding plate 26 is a ferromagnetic member and a movable member magnetically attracted to the paper sheet guiding plate 26 is a permanent magnet. However, it is preferable to apply both of them by permanent magnets in view of a relation of the magnetic forces.

Although the present invention has been described with reference to the particular preferred embodiments, it should be understood that various changes and modifications may be made within the spirit and scope of the invention as defined in the appended claims.

Claims

1. A paper sheet holder comprising:

   a paper sheet guiding plate made of non-magnetic material fixed above a base plate;
   a permanent magnet fixed to one side surface of said paper sheet guiding plate or embedded in said paper sheet guiding plate; and
   a movable permanent magnet or a movable ferromagnetic member movably and magnetically attracted to the other side surface of said paper sheet guiding plate.

2. A paper sheet holder comprising:

   a paper sheet guiding plate made of non-magnetic material fixed above a base plate;
   a permanent magnet fixed to one side surface of said paper sheet guiding plate or embedded in said paper sheet guiding plate;
   a movable permanent magnet or a movable ferromagnetic member movably and magnetically attracted to the other side surface of said paper sheet guiding plate; and
   a means arranged at the other side surface of said paper sheet guiding plate for preventing either the movable permanent magnet or the movable ferromagnetic member from disengaging or dropping.

3. A paper sheet holder as set forth in Claim 1 or Claim 2, wherein the paper sheet guiding plate is arranged in slanted manner above the base plate.

4. A paper sheet holder as set forth in Claim 1 or Claim 2, wherein the paper sheet guiding plate is formed of an arcuate shape having a concave surface to which either the movable permanent magnet or the movable ferromagnetic member is magnetically attracted.

5. A paper sheet holder as set forth in Claim 1 or Claim 2, wherein either the movable permanent magnet or the movable ferromagnetic member has a curved outer wall surface by which it contacts with the paper sheet guiding plate.

6. A paper sheet holder as set forth in Claim 1 or Claim 2, wherein either the movable permanent magnet or the movable ferromagnetic member is constructed by any one of a sphere, a semi-sphere, an ellipse sphere or a semi-ellipse sphere made of non-magnetic material having either the permanent magnet piece or the ferromagnetic member piece in it.

7. A paper sheet holder as set forth in Claim 1 or Claim 2, wherein either the movable permanent magnet or the movable ferromagnetic member is constructed such that either the permanent magnetic piece or the ferromagnetic member piece is movably filled inside any one of a hollow sphere, a hollow semi-sphere, a hollow ellipse sphere or a hollow semi-ellipse sphere made of non-magnetic material.

8. A paper sheet holder comprising:

   a paper sheet guiding plate made of non-magnetic material arranged in a slant manner above a base plate;
   a plurality of permanent magnets embedded in said paper sheet guiding plate while being spaced apart in a horizontal direction; and
   a plurality of movable permanent magnets or movable ferromagnetic members, while being spaced apart in a horizontal direction, movably and magnetically attracting to both side surfaces or one side surface of said paper sheet guid-

ing plate.

9. A paper sheet holder as set forth in Claim 8, wherein either the movable permanent magnet or the movable ferromagnetic member has a curved outer wall surface by which it contacts with the paper sheet guiding plate.

10. A paper sheet holder as set forth in Claim 8, wherein either the movable permanent magnet or the movable ferromagnetic member is constructed by a column-like member made of non-magnetic material of circular section or an ellipse section having a plurality of permanent magnet pieces or ferromagnetic member pieces while being spaced apart by a predetermined distance in it.

11. A paper sheet holder as set forth in Claim 8, wherein either the movable permanent magnet or the movable ferromagnetic member is constructed such that either the permanent magnet piece or the ferromagnetic member piece is movably filled in every section of the hollow cylindrical member made of non-magnetic material having either a circular section or ellipse section partitioned into a plurality of segments in it in a longitudinal direction.

FIG. 1

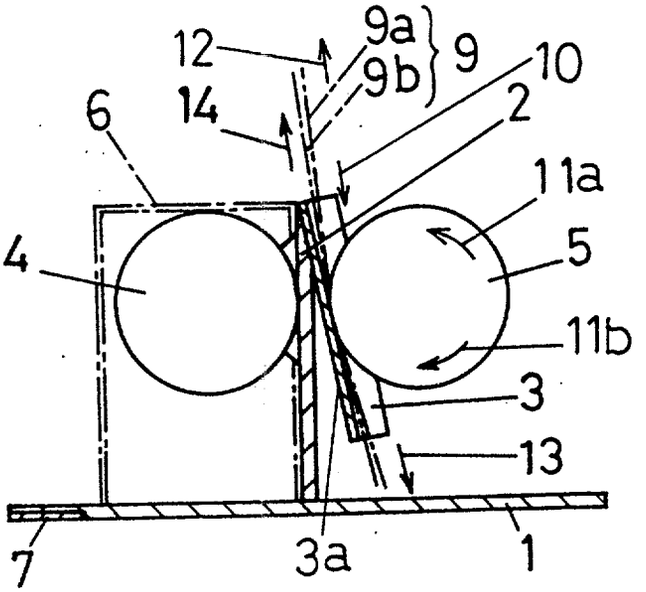


FIG. 2

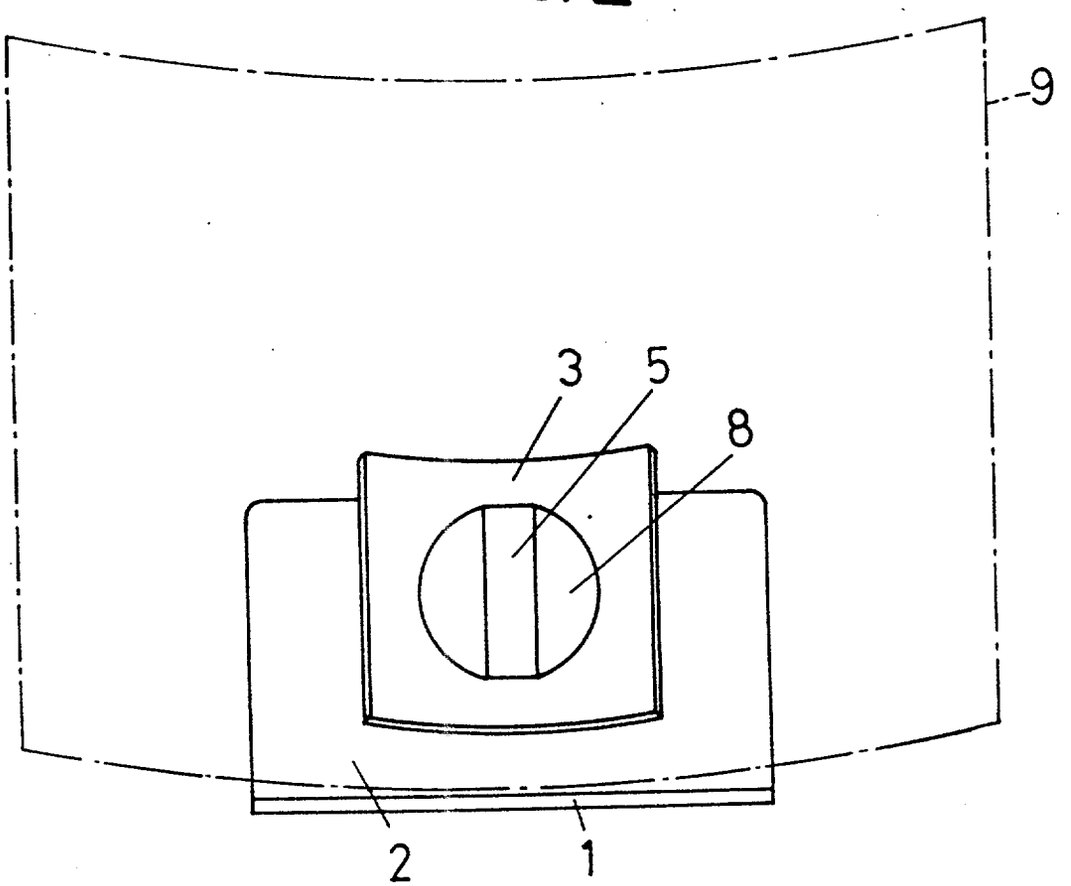


FIG. 3

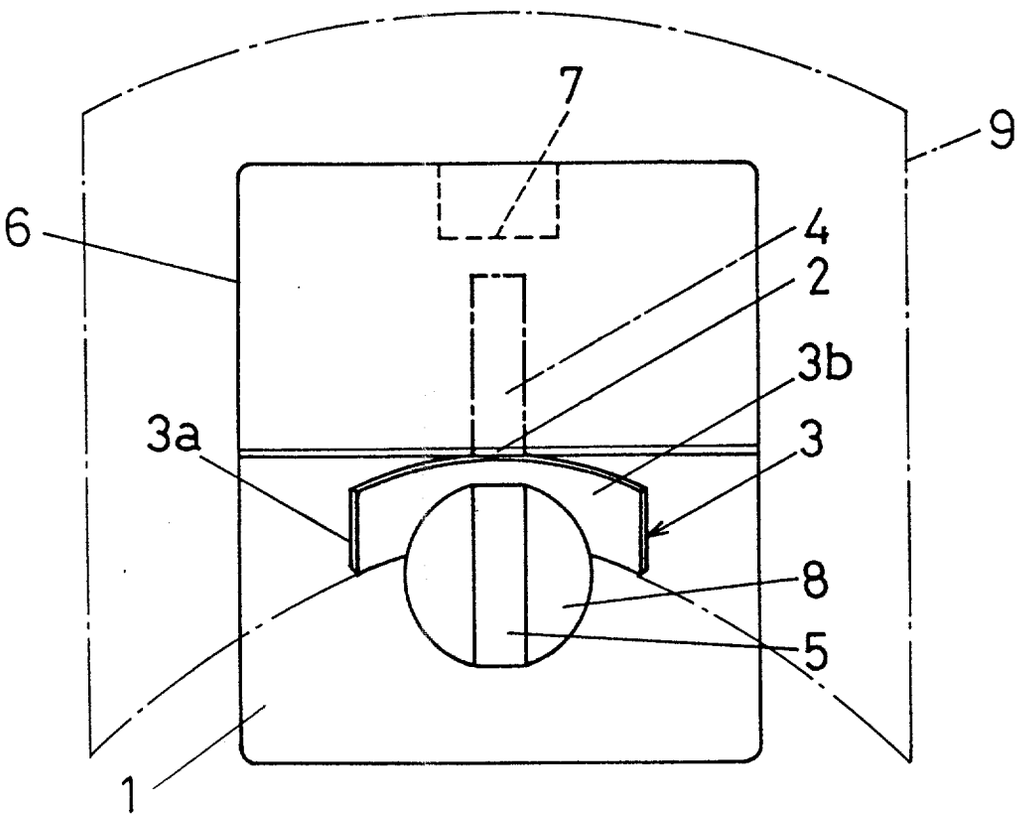


FIG. 4

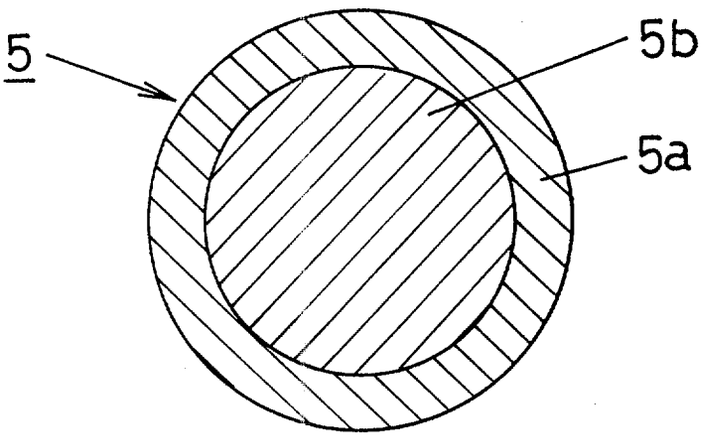


FIG. 5

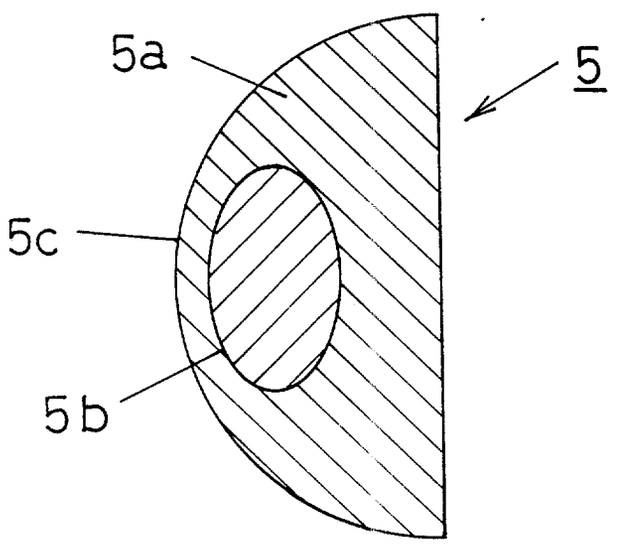


FIG. 6

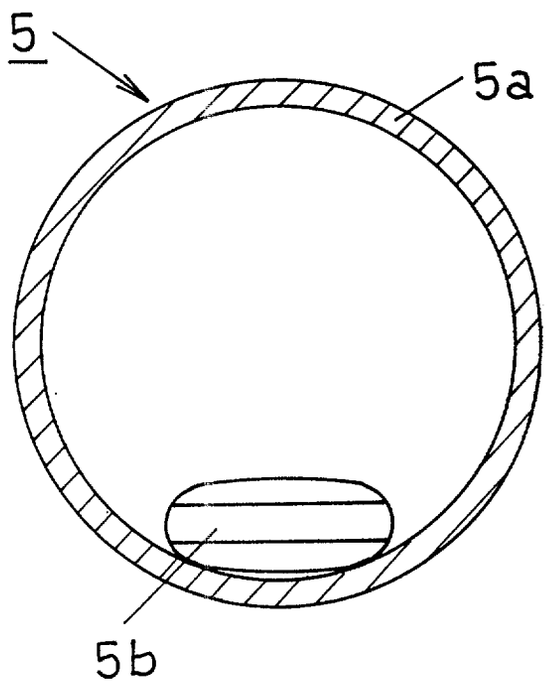


FIG. 7

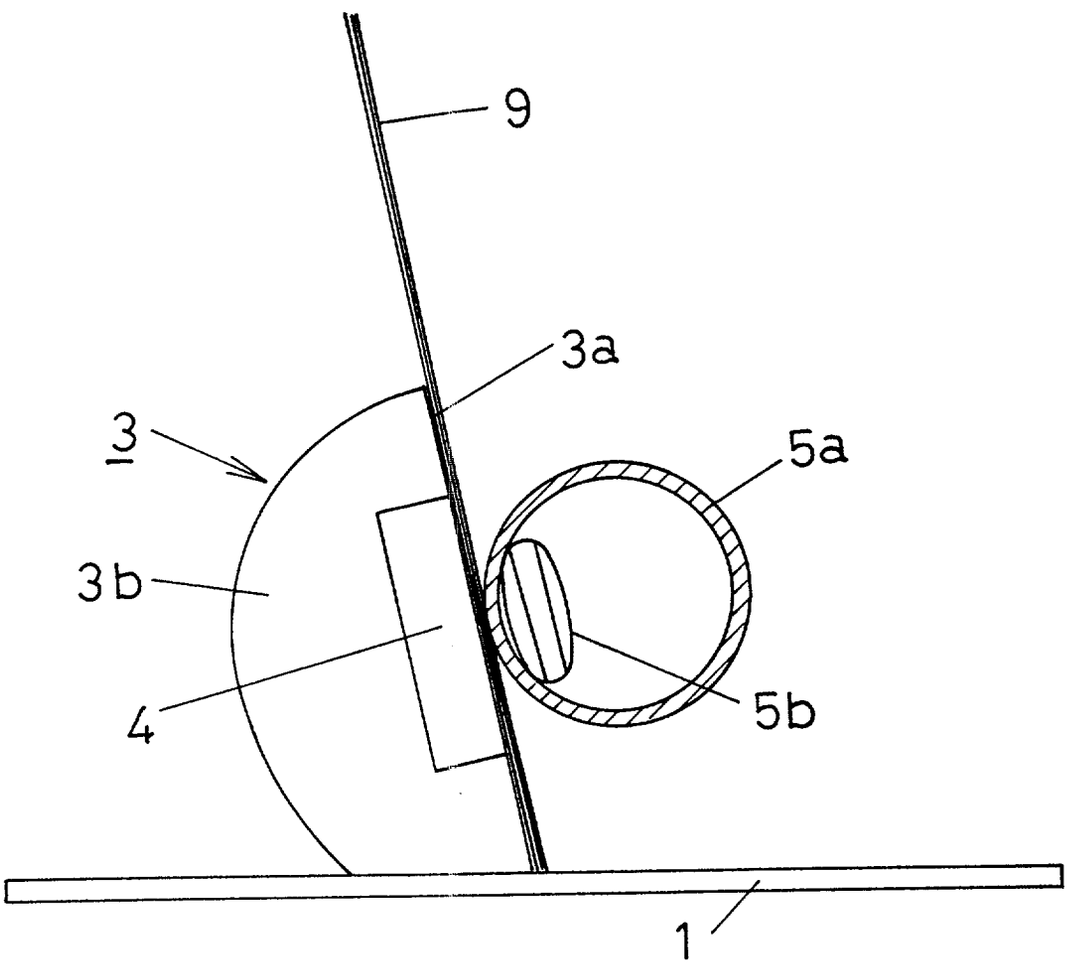


FIG. 8

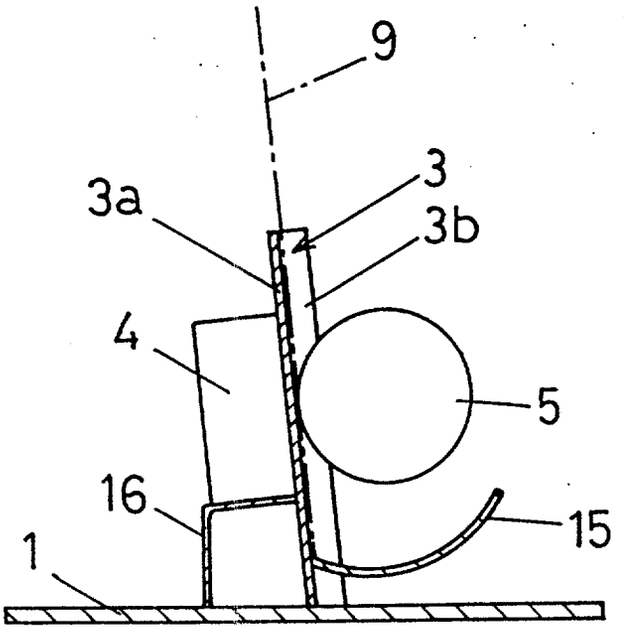


FIG. 9

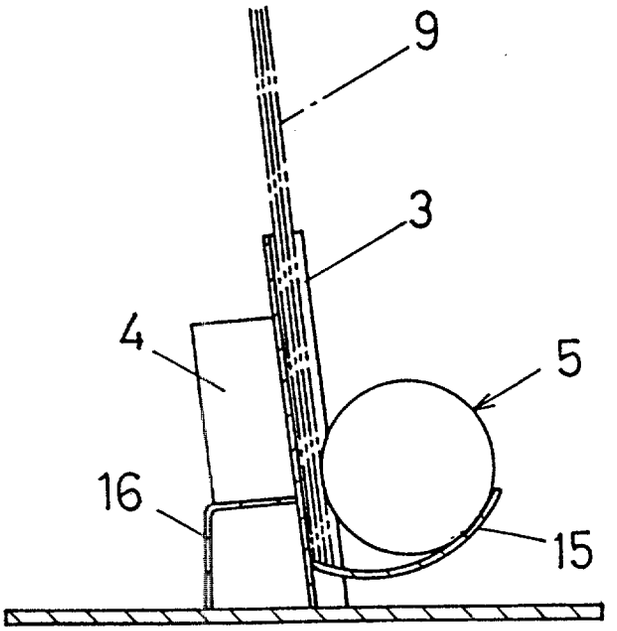


FIG. 10

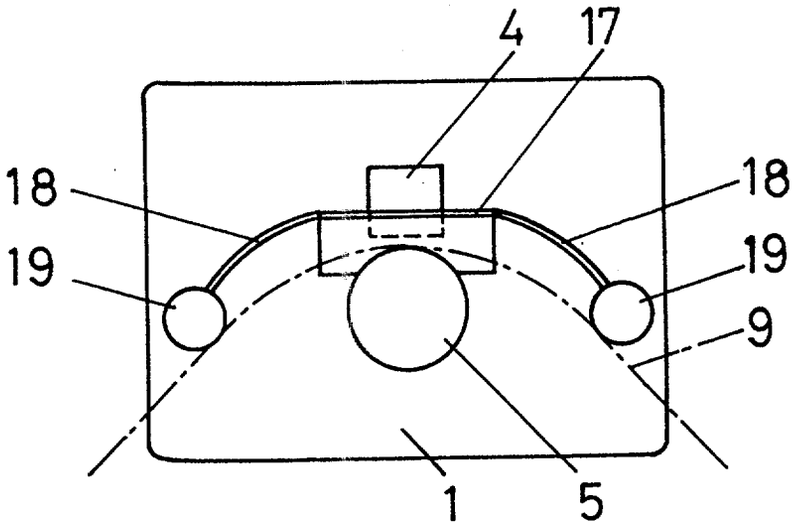


FIG. 11

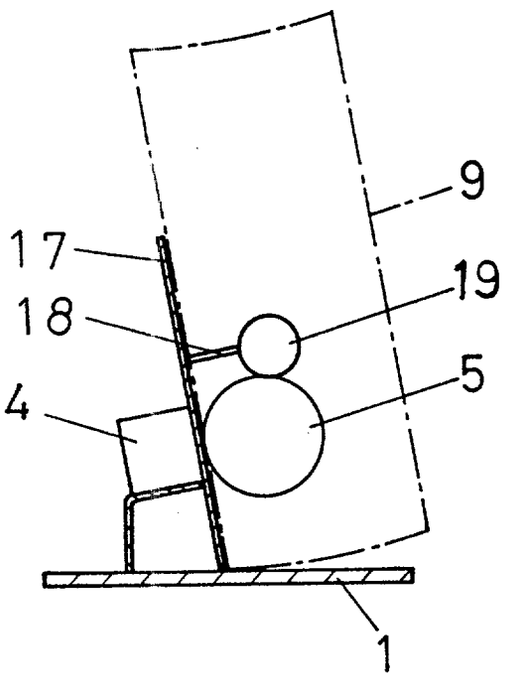


FIG.12

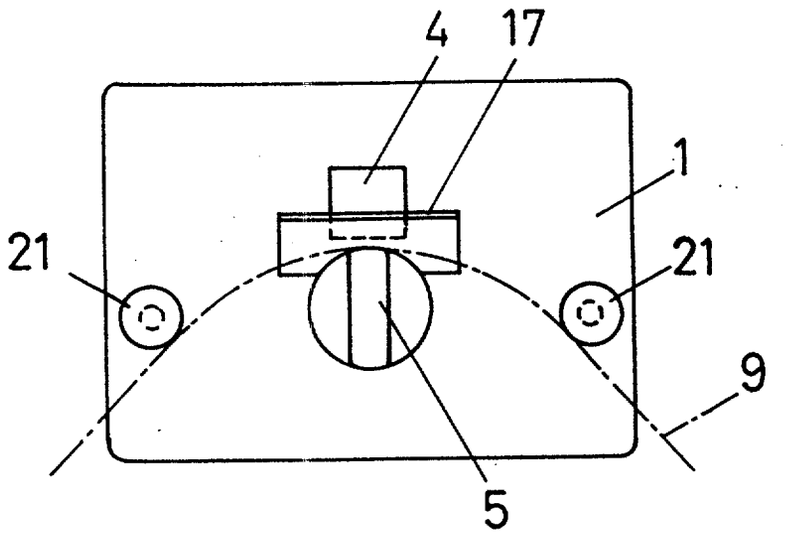


FIG.13

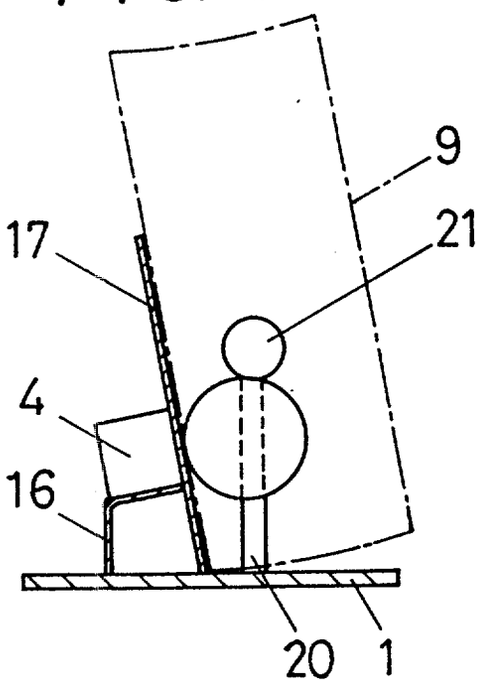


FIG.14

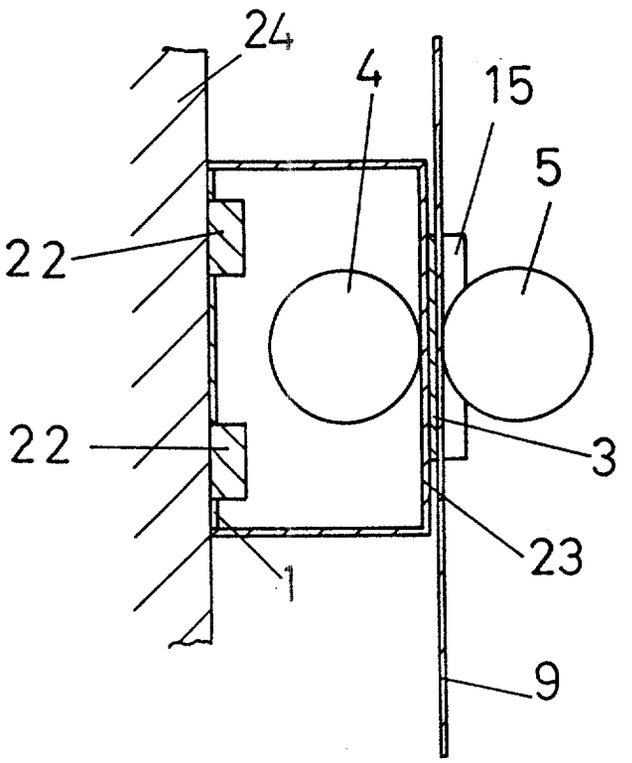


FIG.15

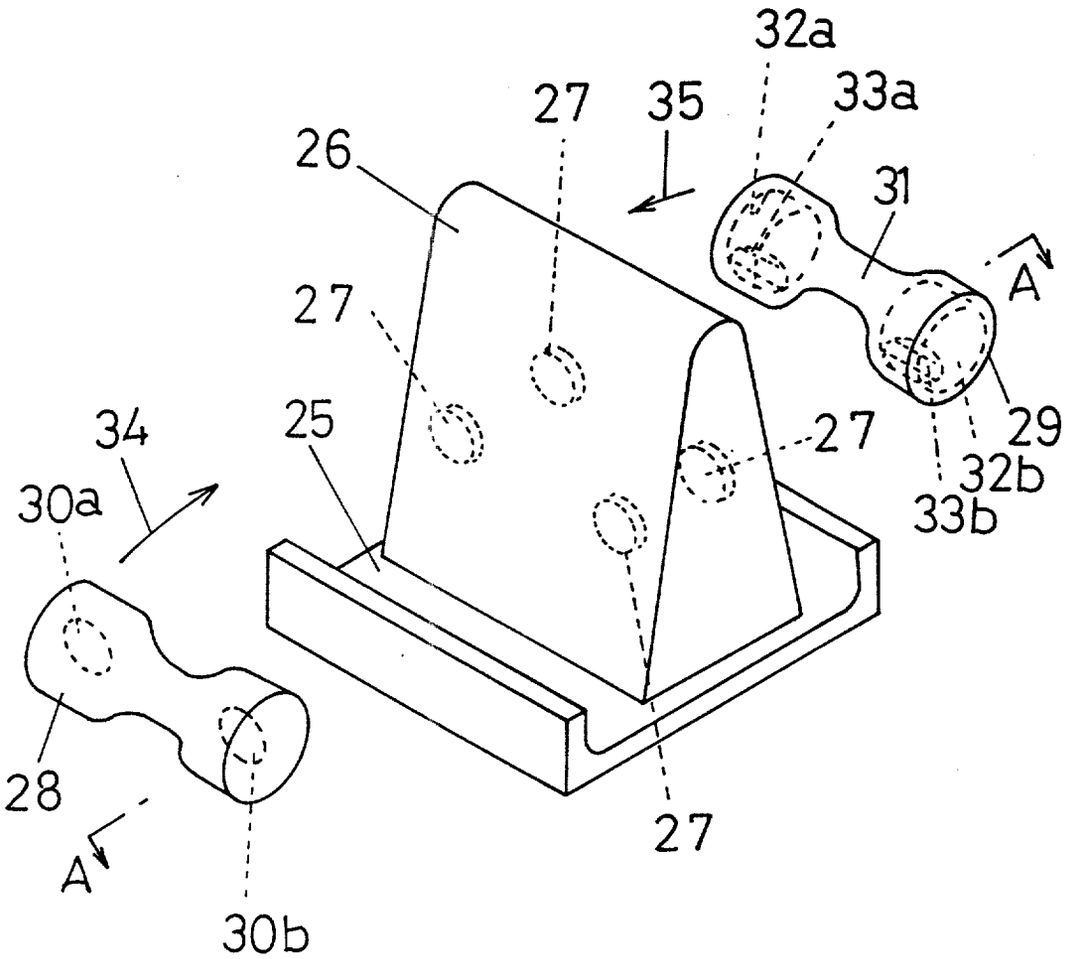


FIG.16

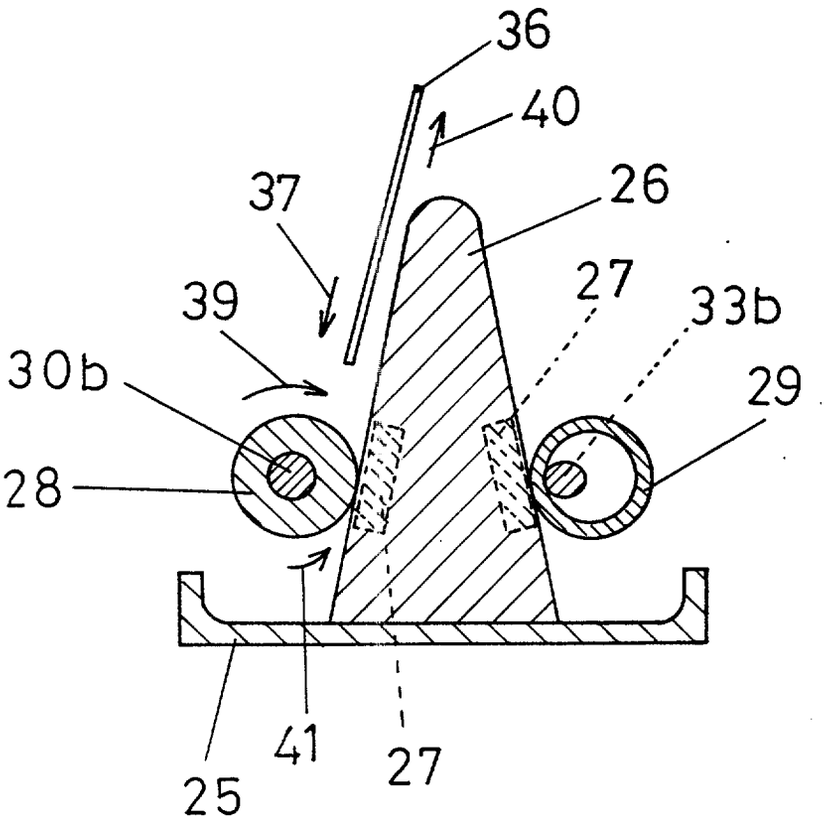


FIG.17

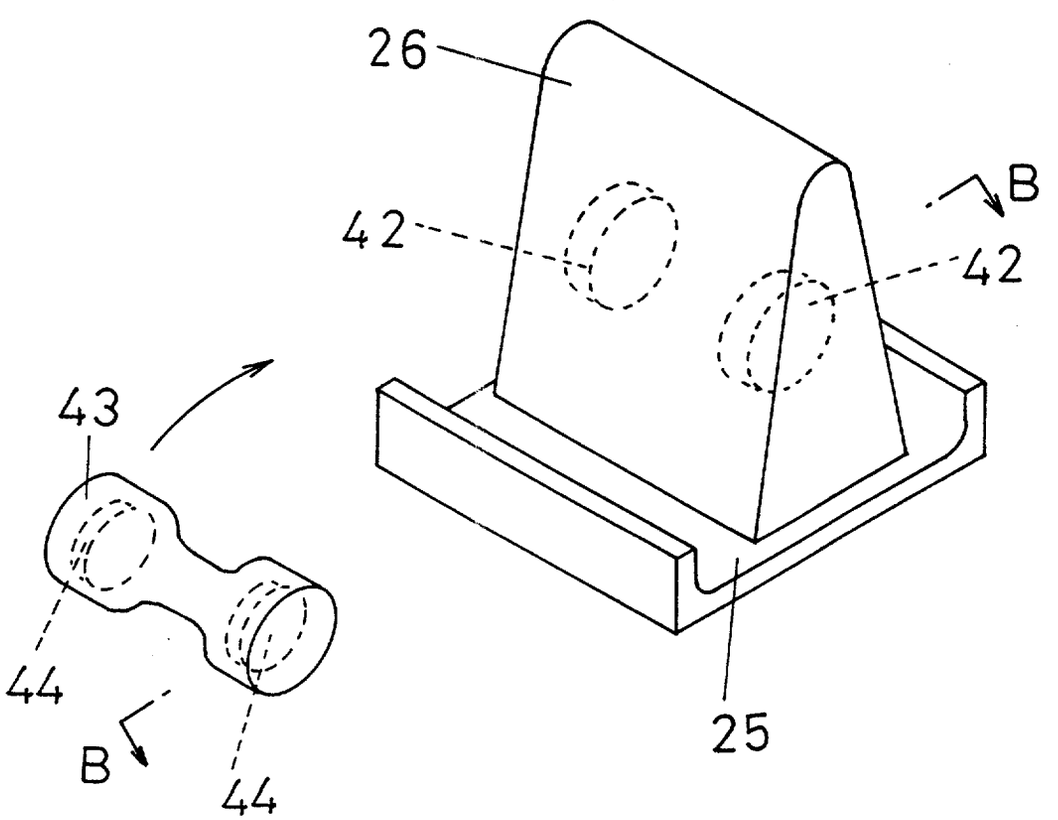
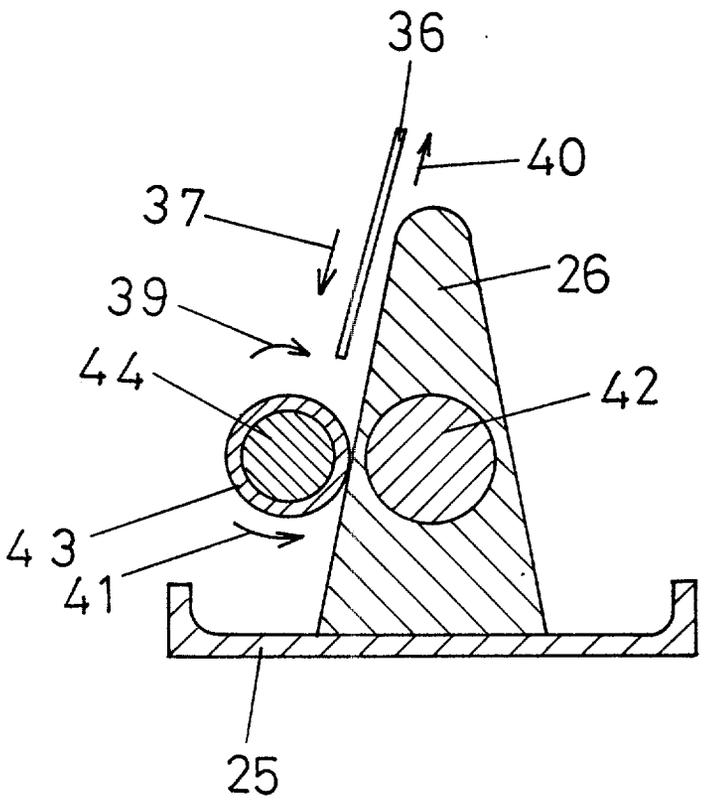


FIG.18



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 30 1788

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	WO 89 05022 A (FINESIGN HB) * the whole document *	1,2,8	G09F1/10
A	FR 2 270 652 A (DASTER OSKAR) * the whole document *	1,2,4,8	
A	US 1 841 690 A (FRED WEINDEL)		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

G09F
B42F
A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17 June 1997	Loncke, J

CATEGORY OF CITED DOCUMENTS

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