Dec. 19, 1961 G. E. W. LEWIN 3,013,296

PIVOT BEARINGS

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FIG.1

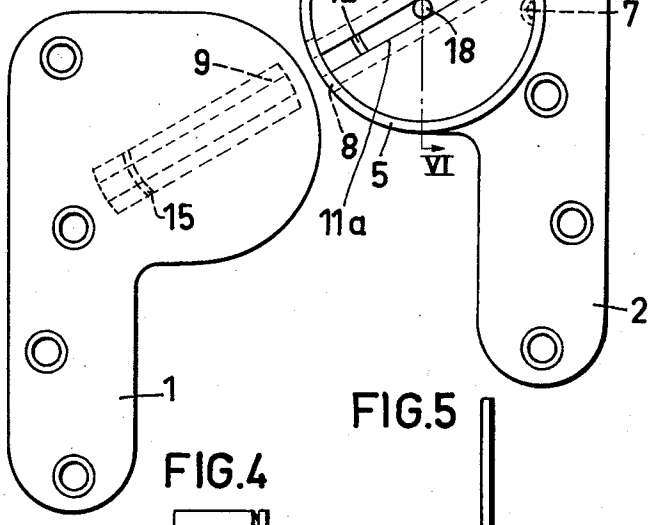


FIG.2

FIG.3

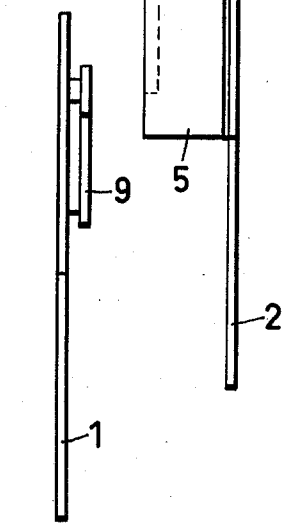
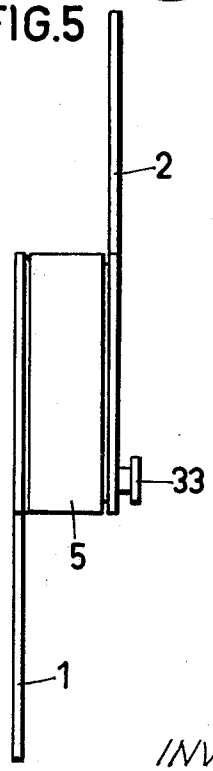


FIG.4

FIG.5



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FIG.6

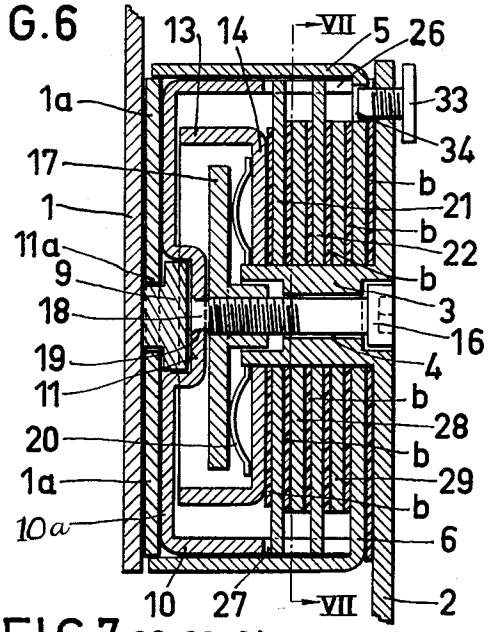
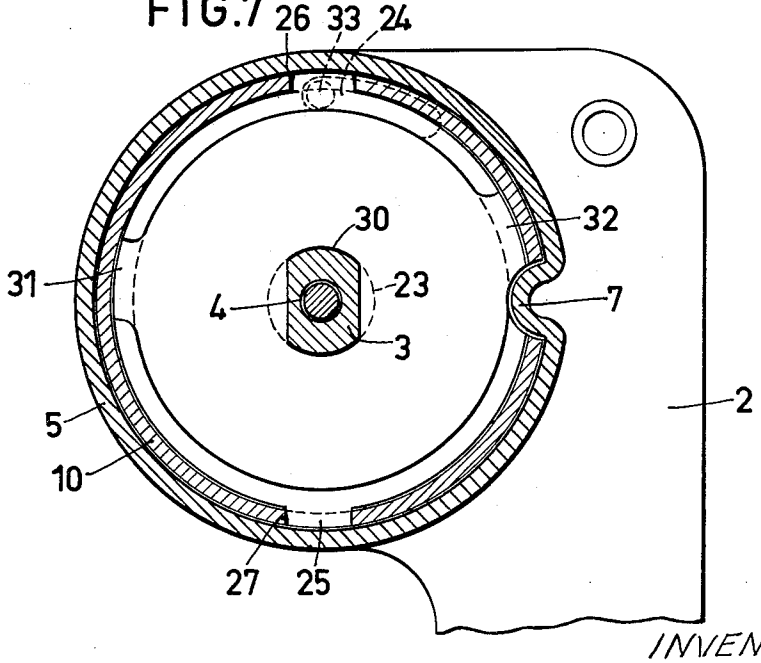


FIG.7



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PIVOT BEARINGS

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FIG.8

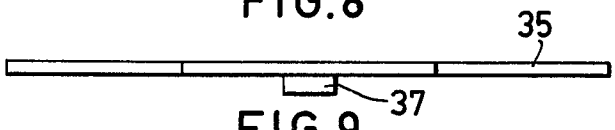


FIG.9

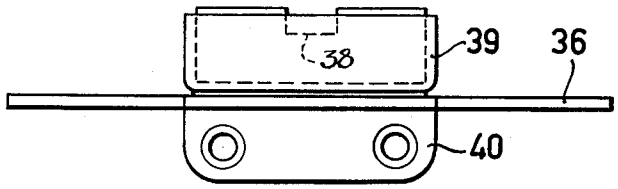


FIG.10

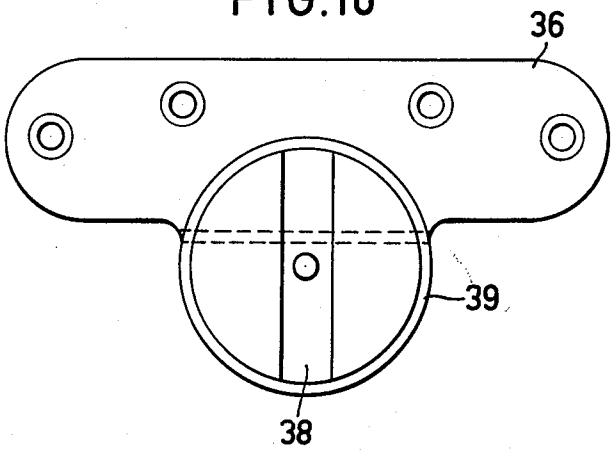


FIG.11

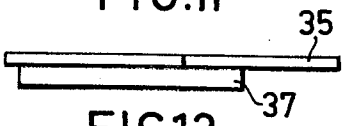
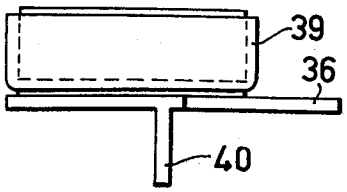


FIG.12



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FIG.13

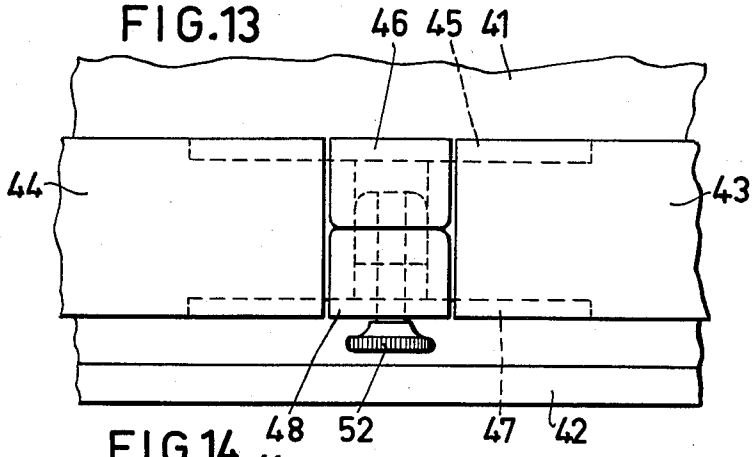


FIG.14

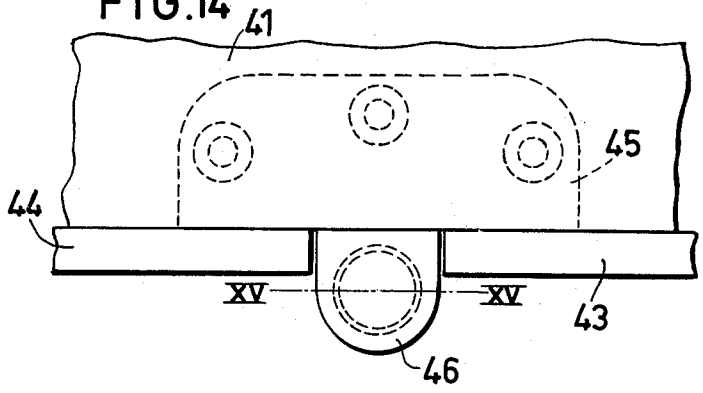


FIG.15

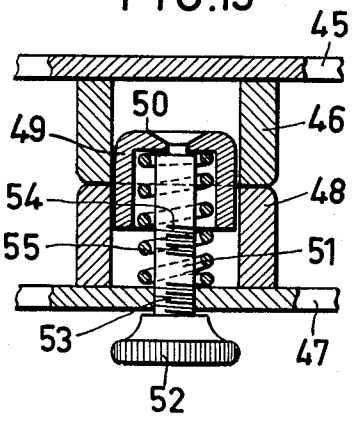
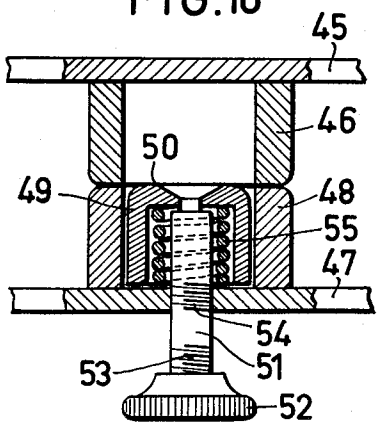


FIG.16



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PIVOT BEARINGS

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Claims priority, application Sweden Apr. 30, 1959
2 Claims. (Cl. 16—140)

The invention relates to pivot bearings and the like for horizontally or vertically pivoted window sashes, comprising separable units, intended for the window sash, and the window frame respectively, and adapted to frictionally retain the window sash in the desired open position.

More particularly still the invention relates to such a pivot bearing for window sash in which the bearing has a single rotational axis and which is so arranged that the mounting means for the sash is readily disengaged from the portion of the pivot bearing mounted on the frame so that the sash can be removed for washing and the like.

This is attained by providing means whereby when the window is pivoted to a specific position, preferably 180° of rotation from the fully closed position, the sash can be lifted from the frame.

In addition, the bearing member is provided with friction disks, some mounted for rotation with the sash and others held stationary with respect to the window frame, the disks being spring-urged into engagement with each other whereby the pivotal movement of the window is against friction and the window will remain in an adjusted position.

Furthermore, means are provided to limit the pivotal movement of the window sash to a desired angle for ventilation purposes which contributes to safety in that the window cannot be opened so widely as to endanger the lives of those who may inadvertently lean against it.

It is an object of the invention to provide a small compact pivot bearing for window sash in which a single immovable pivot point is provided.

It is another object of the invention to provide such a pivot bearing which has a friction braking arrangement incorporated therein.

It is a further object of the invention to provide for mounting the sash on the bearing in such manner that it may be readily removed when the window is in a single desired position, but is at other times firmly held to the bearing.

It is a still further object of the invention to provide a window sash pivot bearing as indicated above including means for limiting the opening movement of the sash.

Other objects and features of the invention will be apparent when the following description is considered in connection with the annexed drawings, in which,

FIG. 1 is a front elevational view of a mounting plate provided for mounting on the sash of a horizontally pivoted window;

FIG. 2 shows a similar front elevational view of the pivot bearing which is mounted on the window frame, it being understood, however, that the mounting means of FIGS. 1 and 2 may be interchanged;

FIG. 3 is a side elevational view of the mounting plate of FIG. 1;

FIG. 4 is a side elevational view of the pivot bearing and mounting plate of FIG. 2;

FIG. 5 is a side elevational view similar to the view of FIG. 4 but showing the mounting plate of FIG. 1 in position on the bearing of FIG. 2 and the mounting plate of FIG. 1 rotated through 180°;

FIG. 6 is a vertical cross-sectional view of the bearing and mounting plates of FIGS. 1 and 2 taken on the plane of the line VI—VI of FIG. 2;

FIG. 7 is a vertical cross-sectional view of the device of the preceding figures, the section being taken on the plane of the line VII—VII of FIG. 6;

FIG. 8 is a side elevation of a mounting plate similar to the plate of FIG. 1, but adapted for use with a vertically pivoted sash;

FIG. 9 is a side elevation of the pivot bearing mounted ordinarily on the window frame and cooperating with the plate of FIG. 8;

FIG. 10 is a top plan view of the mounting plate and bearing of FIG. 9;

FIG. 11 is an end elevation of the mounting plate of FIG. 11 viewed from the right;

FIG. 12 is an end elevation of FIG. 9 viewed from the right;

FIG. 13 shows a device which is mounted at the top of the window frame and sash forming the upper bearing. This view is taken from the inner side of the window and is thus a front elevation as one faces the window;

FIG. 14 is a top plan view of the bearing of FIG. 13;

FIG. 15 is a vertical cross-sectional view of the device of FIGS. 13 and 14, the view being taken on the plane of the line 15—15 of FIG. 14; and

FIG. 16 is a view similar to FIG. 15 but showing the parts operated into position for removing the window sash from the frame.

Referring now to the drawings and especially to FIGS. 1 through 7, the reference numeral 1 denotes a mounting plate intended for the window frame, and 2 denotes a mounting plate intended for the window sash. The reference numeral 3 (see FIGS. 6 and 7) denotes a pin fixed to the mounting plate 2. That part of the pin which is fixed in said mounting plate, is non-circular and is traversed by a bore 4, the ends of which are enlarged (see FIG. 6). The reference numeral 5 designates a circular casing having a plane bottom 6 and a lateral depression 7 in its circumference. Said depression functions as a stop against rotation. The reference numeral 8 denotes a recess or notch in the outer edge of the casing 5.

A cylindrical casing 10 is inserted within the casing 5, the plane closed end 10*a* of casing 10 being provided with a diametrically extending depression 11. Mounted on the exterior surface of the closed end 10*a* is a split plate 1*a*, the facing edges of the split extending parallel to the edges of depression 11. Thus a slit, T-shaped in cross-section, is formed, one end of which communicates with the recess 8.

A T-shaped flange 9 is fixed to the mounting plate 1, this flange being adapted to be inserted through the groove formed by the depression 11 and the slit 11*a*. The depression 11 is provided with a transverse, arcuate slit 12 (FIG. 2) adapted to be entered by an outwardly directed arcuate flange 13 of a plate 14. Thus flange 13 will fit into a recess 15 in the T-shaped flange 9, and will interlock the two parts of the bearing device during their rotation, the flange 13 being notched to permit entry of the T-flange 9 in but one position of the casing 10.

A screw 16 (FIG. 6) is mounted in the pin 3 and screwed into a circular disk 17. Screw 16 at its end 18 is passed through a hole 19 in the depression 11, the end 18 being upset or provided with a locking ring in order to hold the two casings 5 and 10 together. The reference numeral 20 designates a convex circular spring washer which is mounted on pin 3. When the screw 16 is screwed into the disk 17, said spring washer transmits and distributes the increasing pressure on the screw to plate 14. The reference numerals 21 and 22 denote circular plates which are provided with holes 23 in which the non-circular pin 3 can rotate. The plates are provided with radially extending tongues 24 and 25 which

enter into slits 26 and 27 in the inwardly directed part of the inner casing 10 and are thus prevented from rotating relative to casing 10. The plate 14 and circular plates 28, 29 are provided with non-circular center holes 30 corresponding to the cross section of the non-circular pin 3 and are thus prevented from rotation relative to the pin 3. The plates 28 and 29 have radially extending tongues 31 and 32 which, during the rotation of the bearing device, are stopped by the depression 7 in the casing 5 and thereby limit the rotation of the bearing device. Between the plates 14, 21, 22, 28, 29 and between the bottom 6 of the casing 5 and the mounting plate 2 there are provided plates *b* having center holes admitting of rotation around the pin 3. These plates are made of a very frictional material, e.g. Dacron, nylon or the like. The reference numeral 33 denotes a stop pin adapted to be screwed into or inserted in the mounting plate 2. The inwardly directed end of said pin enters into a circular slit 34 in the bottom 6 of the casing 5 and limits the rotation of the bearing device.

In the bearing device according to FIGS. 8 to 12 the device is adapted for a window rotating about a vertical axis. The reference numeral 35 denotes the mounting plate for the window sash and 36 the mounting plate for the window frame. The reference numeral 37 denotes a rectangular bar on the mounting plate 35, said bar being intended to be fitted into a depression 38 in a casing 39, which is rotatably arranged in the same manner as previously described with respect to FIGS. 1 to 7. The reference numeral 40 denotes a support flange on the plate 36.

The device according to FIGS. 13 to 16 is intended for use as upper pivot fitting in vertical pivoted sashes. The window frame is denoted by 41 and the window sash by 42. The reference numerals 43 and 44 denote stop flanges fixed to the window frame, and the window sash respectively. A mounting plate 45 is fixed to the window frame 41, e.g. by screws. A sleeve 46 is arranged perpendicularly on said mounting plate. The reference numeral 47 denotes a mounting plate fixed to the window sash 42, e.g. by screws. A sleeve 48 is arranged perpendicularly on said mounting plate 47. The reference numeral 49 denotes a stud which is rotatably and displaceably mounted in the sleeve 48 and provided with a bottom hole 50, said stud being fitted to the sleeve 46. The end of a screw 51 is rotatably mounted in said hole 50. The reference numeral 52 denotes a part of the screw 51 passing through a threaded hole in the mounting plate 47 and formed as a handle. The screw is provided with outer threads 53 near the handle as well as with inner threads 54 which, like the threads 53, fit the threads in the hole of the mounting plate 47.

According to FIGS. 1 and 2 the two halves of the bearing device are separate from each other, and the mounting plate 2 is turned through 180°. The mounting plate shown in FIG. 1 with its elements is to be mounted in the middle of the sides (not shown in the drawings) of the window frame, with the T-shaped flange 9 directed towards the depression 11. The mounting plate 2 shown in FIG. 2 with its elements is to be mounted in the sides (not shown in the drawings) of the respective window sash, opposite the bearing parts according to FIG. 1 mounted on the window frame. When the sash is to be hung in the frame, the bearing halves according to FIG. 2 are inserted in the bearing halves according to FIG. 1 in the frame, the flanges 9 entering into the depressions 11 and stopping against the insides of the casing 5. The window sash, and thus also the bearing half according to FIG. 2, is now swung back through 180° to closed position according to FIG. 5. During this movement the mounting plate 2 accompanies the window sash, while the casing 5 remains in its position on the mounting plate 1. When the swinging begins the outwardly directed part 13 of the plate 14 enters through the slit 12 into the recess 15 of the flange 9 and locks the flange in the depression 11 of the casing 5.

The bearing parts according to FIGS. 1 and 2 are thus locked during the swinging of the bearing device from 180°. When the window sash has been turned through 180° it can be lifted out. When the window sash, and thus also the mounting plate 2, is rotated, the non-circular pin 3 which is inwardly directed on the mounting plate 2, and thus also the plates 14, 28 and 29 partake in the movement. The plates 21 and 22 are by means of the tongues 24 and 25 which enter into the slits 26 and 27, anchored to the inner casing 10 which, by the depression 7 in the casing 5, is prevented from rotating. Between the plates 21 and 22 anchored to the casing 10 and the plates 28 and 29 accompanying the pin 3 and between the bottom 6 of the casing 5 and the mounting plate 2 there are rotatably mounted thin plates *b* of frictionally acting material. The screw 16 traversing the pin 3 and threaded into the circular disk 17 actuates, upon being screwed in, the circular spring plate 20 which under spring pressure presses the plates 14, 21, 28, 29 and the bottom 6 of the casing 5 towards the mounting plate 2 and, during rotation, effects a friction against the plates *b*.

When the open position of the window sash is to be limited to a predetermined position, e.g. 30°, the stop pin 33 is screwed into or inserted in the mounting plate 2 and enters into the slit 34 in the bottom 6 of the casing 5, the rotation of the mounting plate 2 relatively to the mounting plate 1 being dependent of the length of the slit 34.

In the embodiment according to FIGS. 8–12 the bearing device is adapted for vertical pivoted sashes. In such windows the pivot bearings are mounted in the bottom, and top respectively, of the frame and the sash. The flange 9 has here been replaced by the rectangular bar 37 on the mounting plate 35 for the window sash, and is adapted to be inserted into a corresponding depression 38 in the casing 39 on the mounting plate 36 for the window frame. The mounting plate 36 has been reinforced by the support flange 40. In other respects the bearing device according to FIGS. 8 to 12 functions in the manner as described with reference to FIGS. 1 to 7.

In the embodiment according to FIGS. 13 to 16 in combination with the embodiment according to FIGS. 8 to 12 one must now, when the window sash 42 is to be lifted out from the frame 41, turn the screw 51 so that the outer threads 53 are disengaged from the threads in the mounting plate 47, the stud 49 being retained in the sleeve 46 by spring action from a helical spring 55 and must be pulled out so that the inner thread 54 can be made to engage the threads in the mounting plate 47. Now the upper portion of the window sash can be swung, for instance inwards, and the lower sash fitting, according to FIGS. 8 to 12, be lifted out from its frame fitting. When the window sash is to be put in, the lower sash fitting is inserted in the frame fitting and the window sash is moved to vertical position. The inner threads 54 of the screw 51 are now in engagement with the threads of the mounting plate 47, the outer portions of the sleeves 46 and 48 resting against one another. Thereafter the lastmentioned thread engagement is released and by the action of the spring 55, the stud 49 partly returns into the sleeve 46. Thereupon the device is locked by screwing the outer threads 53 of the screw into the threads of the mounting plate. If for some reason the outer threads of the screw should be disengaged from the thread engagement with the threads of the mounting plate 47, the stud 49, due to the pressure of the spring 55, partly remains in the sleeve 46 and prevents the window sash from getting loose from the frame.

The invention is not restricted to the embodiments disclosed and described but may be modified without departing from the basic ideas of the invention. Thus, the T-shaped flange may be replaced by flanged pins or bars designed in some other manner. The flange may also be locked in the casing by a springloaded pin or the like which in the position in which the sash has been turned

through 180° may, by means of a curved flange, be made to release the flange. The non-circular pin may be replaced by two pins separate from each other on which the plates are either locked or freely running. The stop pin 33 may, by spring action, be made to automatically enter into a slit or the like after the window sash has been swung for cleaning or the like.

What I claim is:

1. A bearing for a window comprising sash and frame elements and in which the window sash is swingable on a single axis in the window frame, comprising, in combination, a generally cylindrical outer casing, a generally cylindrical inner casing fixed to said outer casing, a central pivot having a non-circular cross-section mounted centrally of said outer casing, brake disks mounted on said pivot, some of said disks having non-circular center holes and being engaged by said pivot to rotate therewith, the remaining disks having circular center holes and being in engagement with said inner casing to rotate therewith, a spring plate on said pivot urging said disks

axially against each other, a mounting plate fixed to one element of the window, a flange-and-groove connection between said plate and said inner casing, said flange having a transverse slit, means for securing said pivot to the other element of the window, and a locking member on said pivot entering said transverse slit of said flange, said locking member having a recess therein to release said flange when the window sash has been rotated about 180° from its closed position.

2. In a window bearing as claimed in claim 1, a stop pin manually insertable into and retractable from an arcuate slot in said outer casing.

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