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(71) Applicant: **FRATELLI GUZZINI S.P.A.**
Contrada Mattonata 60
I-62019 Recanati Macerata(IT)

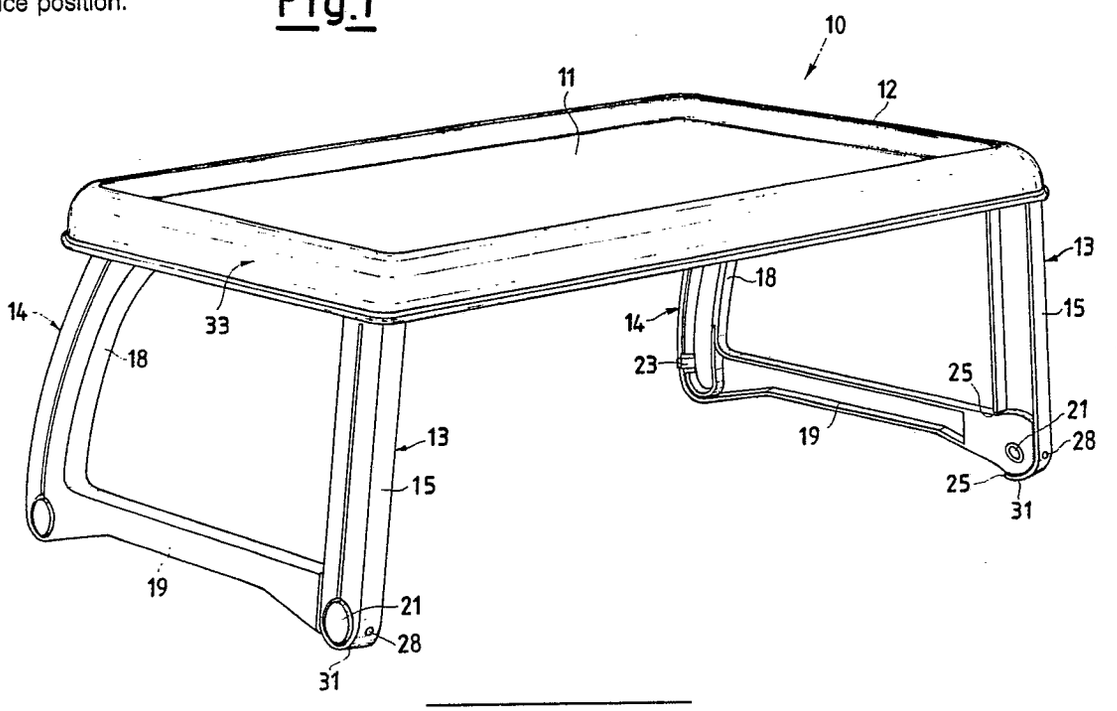
(72) Inventor: **Giurgiaro, Giorgetto**
Via Filadelfia 106
I-10137 Turin(IT)

(74) Representative: **De Carli, Erberto et al**
ING. BARZANO' & ZANARDO MILANO S.p.A.
Via Borgonuovo, 10
I-20121 Milano(IT)

(54) Tray with supporting legs.

(57) A tray with support legs comprises a support plane with which the support legs are linked; the support legs are telescopically articulated with the possibility of being blocked relatively to each other, in order to bring said support plane to an inclined position relatively to a reference positioned, and maintain it in said inclined position relatively to said reference position.

Fig.1



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TRAY WITH SUPPORTING LEGS

The object of the present invention is a tray with supporting legs.

Trays with supporting legs are known, which comprise a support plane with raised edge, which constitutes the true tray, with which supporting legs are connected.

Such a tray can be of the folding type, i.e., the legs are articulated with the support plane in such a way that they can be rotated until they come to rest against the support plane, so that the tray takes a substantially planar configuration. The tray can also be of non-folding type, viz., the legs can be fixed relatively to the support plane.

Such a type of tray is used in particular in bed for consuming meals, i.e., as a supporting structure on which the containers which contain food and beverages rest. For that purpose, the tray is usually positioned astride the user, with the legs of the tray resting on the upper surface of the bed.

The support plane normally takes a substantially horizontal position, in order to prevent the containers containing food and beverages from slipping along it.

If one wishes to use the tray for reading or writing, it can be comfortable for the user to incline the support plane relatively to its horizontal position, towards the same user.

Unfortunately, the common trays with support legs of the above described type do not offer this possibility, i.e., the support plane is fixed, and cannot be inclined.

The purpose of the present invention is of proposing a tray with supporting legs, the support plane of which can be inclined.

Such a purpose is achieved by means of a tray with support legs, comprising a support plane with which the support legs are linked, characterized in that said support legs are telescopically articulated, with the possibility of being blocked relatively to each other, in order to bring said support plane to an inclined position relatively to a reference position, and maintain it in said inclined position relatively to said reference position.

In the following, an exemplifying, non-limitative, form of practical embodiment of the present invention is disclosed, as illustrated in the hereto attached drawing tables, wherein:

Figure 1 shows a perspective view of a tray with support legs according to the present invention, in a first operating configuration;

Figure 2 shows a middle cross-sectional view of the tray of Figure 1;

Figure 3 shows a perspective view of the tray of Figure 1 in a second operating configuration:

Figure 4 is a middle cross-sectional view of the tray of Figure 1 in the operating configuration of Figure 3;

Figure 5 shows a detail of the tray of Figure 1 in the operating configuration of Figure 3;

Figure 6 shows a sectional view according to the path VI-VI of the detail of Figure 5;

Figure 7 shows a bottom plan view of the tray of Figure 1 in a folded configuration;

Figure 8 shows a further detail of a cross-section according to path VIII-VIII of Figure 7;

Figure 9 shows a further detail of a sectional view according to path IX-IX of Figure 7.

The depicted tray, generally indicated by the reference numeral 10, comprises a support plane 11 with a raised edge 12, both of rectangular shape. In correspondence of each one of the shorter sides of the support plane 11, with the same plane two supporting legs 13 and 14 are linked.

The leg 13 is of fixed length, and is constituted by a rectilinear element 15 having an "U"-shaped outline.

The leg 14 is more complex, and can be telescopically extended. It comprises an internal element 16 having a circle-arc-shape, with an "U"-shaped outline, which is linked with the element 15 by means of a cross-piece 17, with which it forms one single piece. The leg 14 furthermore comprises an external element 18, having a circle-arc-shape, with an "U"-shaped outline, inside which the element 16 is slidingly inserted, and which extends into a portion 19 which transversely links the same element 18 with the element 15.

The cross-piece 17 is linked with the support plane 11 by means of two hinges 20.

The portion 19 of the element 18 is connected with the element 15 by means of a hinge 21.

As regards the coupling between the element 16 and the element 18, and with particular reference to Figures 5 and 6, the element 18 is provided with two longitudinal bent edges 22 opposite to each other, which retain the element 16 inside the element 18. The element 16 is provided with an elastically yielding tongue 23, suitable for entering slots 24 provided on one of above-said two edges 22; in the form of practical embodiment shown, the slots 24 are two, and are provided in the nearby of end points of the element 18.

The tray 10, as disclosed, has two operating configurations, i.e., the configuration depicted in Figures 1 and 2, and the configuration depicted in Figures 3 and 4.

In the configuration depicted in Figures 1 and 2, referring to each couple of legs 13 and 14, the internal element 16 is completely inserted inside

the external element 18, and the portion 19 of this latter results to be perpendicular to the element 15. In such a configuration, the support plane 11 is in a horizontal position.

In the configuration shown in Figures 3 and 4, referring to each couple of legs 13 and 14, the internal element 16 is mostly extracted from the external element 18, constituting an extension thereof, and the portion 19 of the external element 18 forms an obtuse angle with the element 15. In such a configuration, the support plane 11 is in an inclined position relatively to the above-said horizontal position.

In order to turn from the configuration relevant to the horizontal support plane, to the configuration relevant to the inclined support plane, and vice-versa, it is enough that both structures, each one constituted by the element 15, the cross-piece 17 and the internal element 16, rotate relatively to the respective external elements 18 around their respective hinges 21. During this movement, each internal element 16 and its respective external element 18 slide, with a relative rotational movement, along a circle-arc-shaped trajectory, corresponding to their circle-arc development, with the rotation centre being in the respective hinge 21.

In the configuration shown in Figures 1 and 2, relevant to the horizontal support plane, referring to each leg 14, the tongue 23 enters the lower slot 24 in order to block the internal element 16 on the external element 18, so as to prevent the leg 14 from extending, and maintaining the tray in such a configuration.

In the configuration of Figures 3 and 4, relevant to the inclined support plane, referring to each leg 14, the tongue 23 enters the upper slot 24 in order to lock the internal element 16 to the external element 18, so as to prevent the leg 14 from becoming shorter, and maintain the tray in such a configuration.

In order to be able to move each internal element 16 relatively to the corresponding external element 18, and, therefore, to turn from the one configuration to the other one, it is enough to apply a pressure to the tongue 23, so as to disengage it from the slot 24; during the relative movement between the elements 16 and 18, the tongue 23 is elastically deformed by the edge 22 in which the slots 24 are provided, until said tongue elastically snaps into one of the same slots.

The relative rotation of each couple of elements 15 and 18 around the hinge 21 is limited in both directions of rotation by stop edges 25 of the element 15, against which the portion 19 of the element 18 comes to rest.

The elements 15 are provided with a lower end 31 having a circle-arc-shape, in order to favour the rotation of the elements 15 on the base, on which the tray 10 rests, during the movement of inclination of the support plane 11, and during the reverse movement.

The tray 10 can be bent, until is takes a substantially planar configuration. This is achieved by rotating the supporting legs 13 and 14 around the hinges 20, until the same legs come to stay, throughout their length, under the support plane 11, and along it, as shown in Figure 7.

In order that the legs 13 and 14 may remain in their open position, corresponding to the configurations of Figures 1, 2, 3 and 4, in a stable way, each cross-piece 17 is provided with a wing 26 destined to elastically interfere against a wall 27, well visible in Figure 8, of the edge 12 of the support plane 11 during the rotation of the cross-piece 17 from the closed position of the legs 13 and 14, corresponding to the configuration of Figure 7, to the open position, and vice-versa. In the passage from the closed position to the open position of the legs 13 and 14, once that the point of elastic interference is overcome, the unintentional return of the same legs to their closed position is prevented by the above said elastic interference, which can only be won by means of an intentional forcing by the user.

In order that the legs may stably remain in their above-said closed position, the elements 15 and 18 are each provided with a small protrusion 28, destined to enter, by elastic click, a corresponding dead hole 29 provided inside the interior of a wall 30 of the edge 12 of the support plane 11, as shown in Figure 9.

Thus, a folding tray with supporting legs, which an inclinable support plate, is provided, so as to meet the requirements stated in the introduction.

We wish to stress that this outcome is achieved by means of a simple, and hence cheap, structure. All the disclosed and illustrated elements of the tray 10 can be made from a plastic material, the cheapness of the tray being hence increased.

In the folded position of Figure 7, the legs 13 and 14 of the tray 10 are completely housed inside a hollow 32 provided under the support plane 11, defined by a lower extension 33 of the raised edge 12. In that way, the folded tray 10 can be used as a normal tray, without supporting legs.

The raised edge 12 is suitable for retaining on the support plane any objects which are resting on it.

Clearly, variants and/or additions to the above, as disclosed and illustrated, can be supplied.

In general, the tray can be provided with supporting legs telescopically articulatable relatively to each other, in order to enable the support plane to be inclined relatively to the horizontal position.

From this viewpoint, one could also think of four legs, at least two of which are suitable for being telescopically extended, with the possibility

of being blocked.

Not necessarily shall each telescopic leg have a circle-arc-shaped configuration and extension, but it can have as well a straight configuration and extension.

Not necessarily shall the legs have to be connected with each other by means of cross-pieces, even if such an arrangement would supply stability to the whole structure, but they can also be independent from each other, at least in correspondence of their bottom end.

As regards the means for blocking the telescopic legs, more than two slots can be provided, inside each of which each locking tongue enters, so as to have a plurality of differently inclined positions of the support plane. Anyway, blocking elements functionally equivalent to as herein those disclosed and illustrated can be used, such as, e.g., screw elements fastening by friction the components of the telescopic leg against each other, as well as different types of blocking means.

As regards maintaining the legs in a stable open position, a system different from the one as above seen can be used, by exploiting the elastic interference, e.g., an elastic-click blocking system, a screw blocking system, or still other blocking systems can be used.

Also as regards blocking the legs in their closed position, blocking elements can be used, which are functionally equivalent to those as herein disclosed and illustrated, constituted by a protruding element and a hole, e.g., stop elements which move from a blocking position to a release position, or still other means.

Blocking means can be provided as well, which are positioned, e.g., on the hinge means of the support legs, which perform the task of retaining these latter both in their open and in their closed positions.

Furthermore, the components of the tray can be given various shapes. For example, the support plane can be, besides rectangular, also square, circular, or it can also be of other shapes, and may also be without a raised edge; the supporting legs can have an outline different from the "U"-shaped outline, e.g., they can have a circular outline; and so forth.

It can also be the internal element, and not the external element, of the telescopic leg, to extend into a portion hinged to an adjacent leg.

The hollow which receives the legs of the tray in their folded position can also be absent.

One could also think of realizing a non-folding tray, i.e., with fixed legs relatively to the support plane.

Claims

1. Tray with support legs, comprising a support plane with which the support legs are linked, characterized in that said support legs are telescopically articulated, with the possibility of being blocked relatively to each other, in order to bring said support plane to an inclined position relatively to a reference position, and maintain it in said inclined position relatively to said reference position.

2. Tray according to claim 1, wherein four support legs are provided, with at least two of said support legs being telescopically extendable, with the possibility of being blocked.

3. Tray according to claim 2, wherein each one of said telescopically-extendable support legs comprises an external element inside which an internal element is slidingly mounted, with both said external and internal element having a circle-arc-shaped configuration in order to be able to move by a circular movement relatively to each other.

4. Tray according to claim 3, wherein either of said external or internal elements extends as a portion linked by means of a hinge to as adjacent element constituting an adjacent support leg, with said hinge constituting the centre of rotation for the relative rotation movement of said internal and external movement.

5. Tray according to claim 3 or 4, wherein elasticclick blocking elements are provided, which block with each other said external and internal elements in predetermined relative positions of these latter.

6. Tray according to claim 5, wherein said blocking elements comprise an elastically yielding tongue positioned on one of said external and internal elements, suitable for entering slots of the other one of said external and internal elements, with the insertion of the tongue in one of the slots corresponding to a predetermined relative position of said external and internal elements.

7. Tray according to claim 4, wherein stop elements are provided, which limit the angular relative stroke between the portion extending from one of said external and internal elements, and said adjacent element.

8. Tray according to claim 2, wherein said legs are hinged to said support plane, in order to be able to rotate between an open position, in which they extend from said support plane, and a closed position in which they lay along the support plane.

9. Tray according to claim 8, wherein elements are provided for the purpose of retaining the support legs in said open position.

10. Tray according to claim 8 or 9, wherein elements are provided for the purpose of retaining the support legs in said closed position.

11. Tray according to claim 3 or 4, wherein said legs are hinged to said support plane, in order

to be able to rotate between an open position, in which they extend from said support plane, and a closed position in which they lay along the support plane.

12. Tray according to claim 11, wherein each one of said telescopically extendable legs and an adjacent leg of fixed length are linked with each other by means of a linking element hinged to said support plane.

13. Tray according to claim 12, wherein elements are provided for the purpose of retaining the support legs in said open position.

14. Tray according to claim 13, wherein said retaining elements comprise a wing on each linking element, which elastically interferes with a wall of the support plane of the tray, in order to retain the support legs in said open position.

15. Tray according to claim 11, wherein elements are provided for the purpose of retaining the support legs in said closed position.

16. Tray according to claim 15, wherein said retaining elements comprise protrusions provided on said support legs, which enter in an elastically click fashion inside hollows provided in said support plane.

17. Tray according to claim 3, wherein said external and internal elements have an "U"-shaped outline.

18. Tray according to claim 4, wherein said external and internal elements, and said adjacent element have an "U"-shaped profile.

19. Tray according to claim 4, wherein said adjacent element is provided with a circle-arc-shaped support end.

20. Tray according to claim 1, wherein said support plane is provided with a raised edge.

21. Tray according to claim 8, wherein under said support plane a hollow is provided, inside which said legs are completely housed when they are in their closed position.

22. Tray according to claim 21, wherein said hollow is defined by a lower extension of an edge of said support plane.

23. Tray according to claim 1, wherein said support plane has a rectangular shape.

24. Tray according to claim 1, wherein said reference position is a substantially horizontal position.

Fig.1

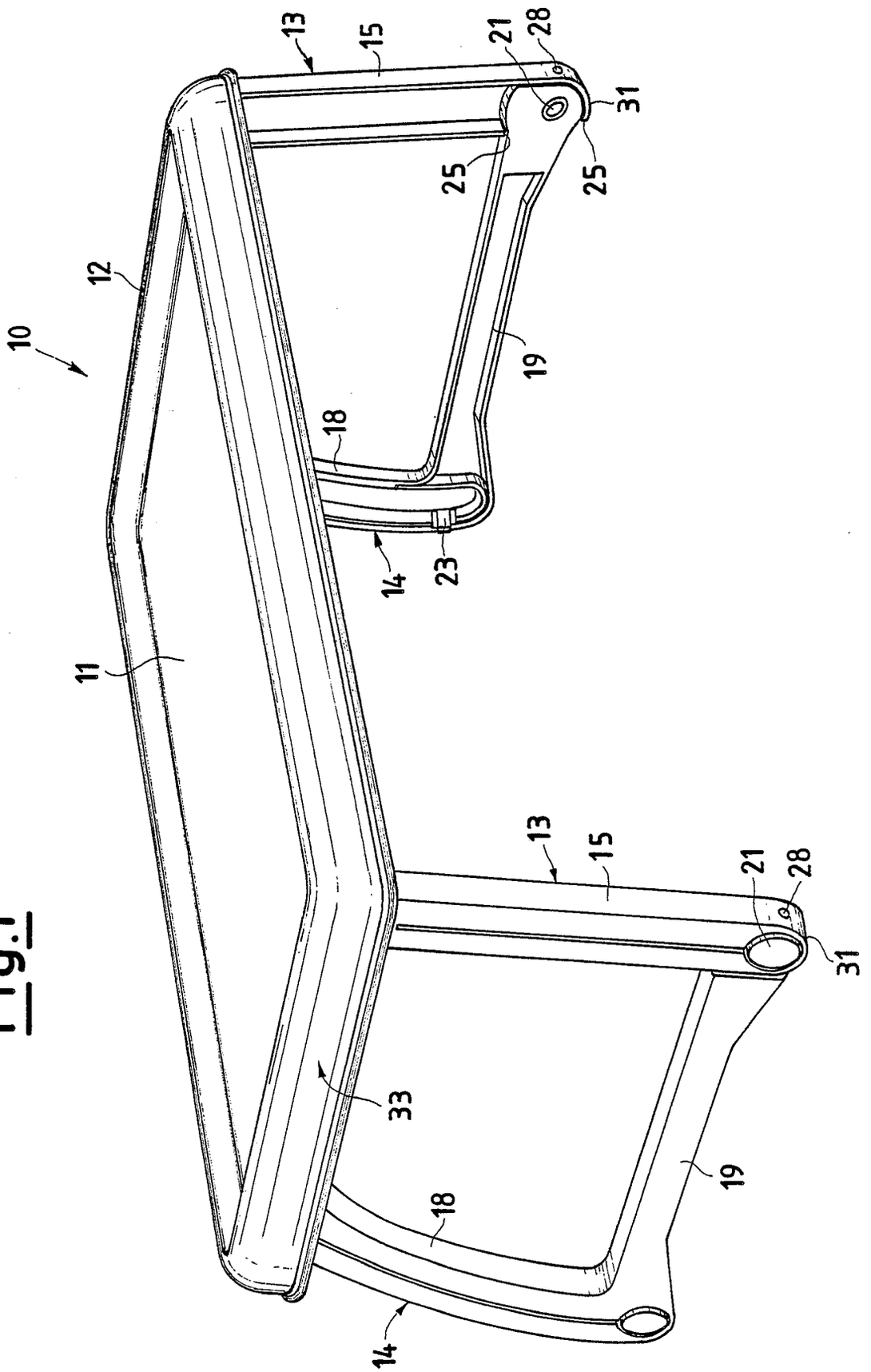

Fig.2

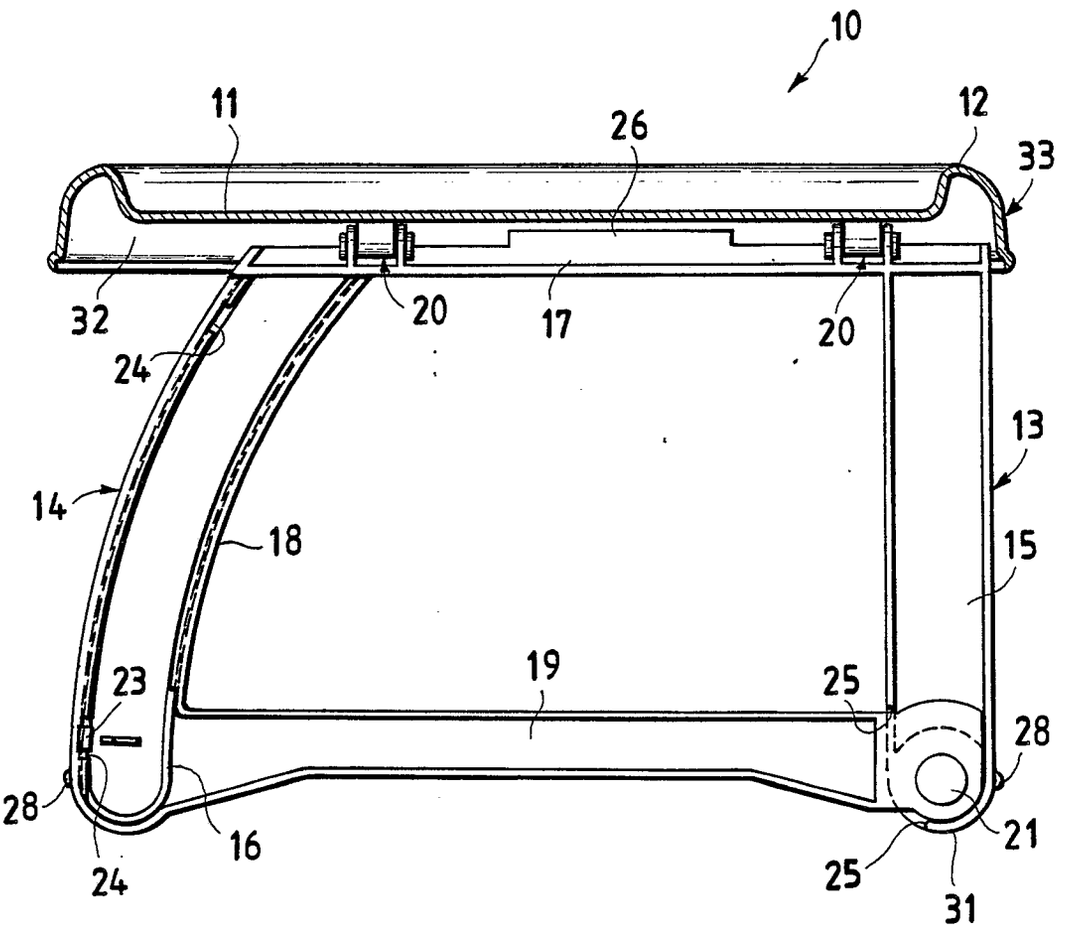

Fig.3

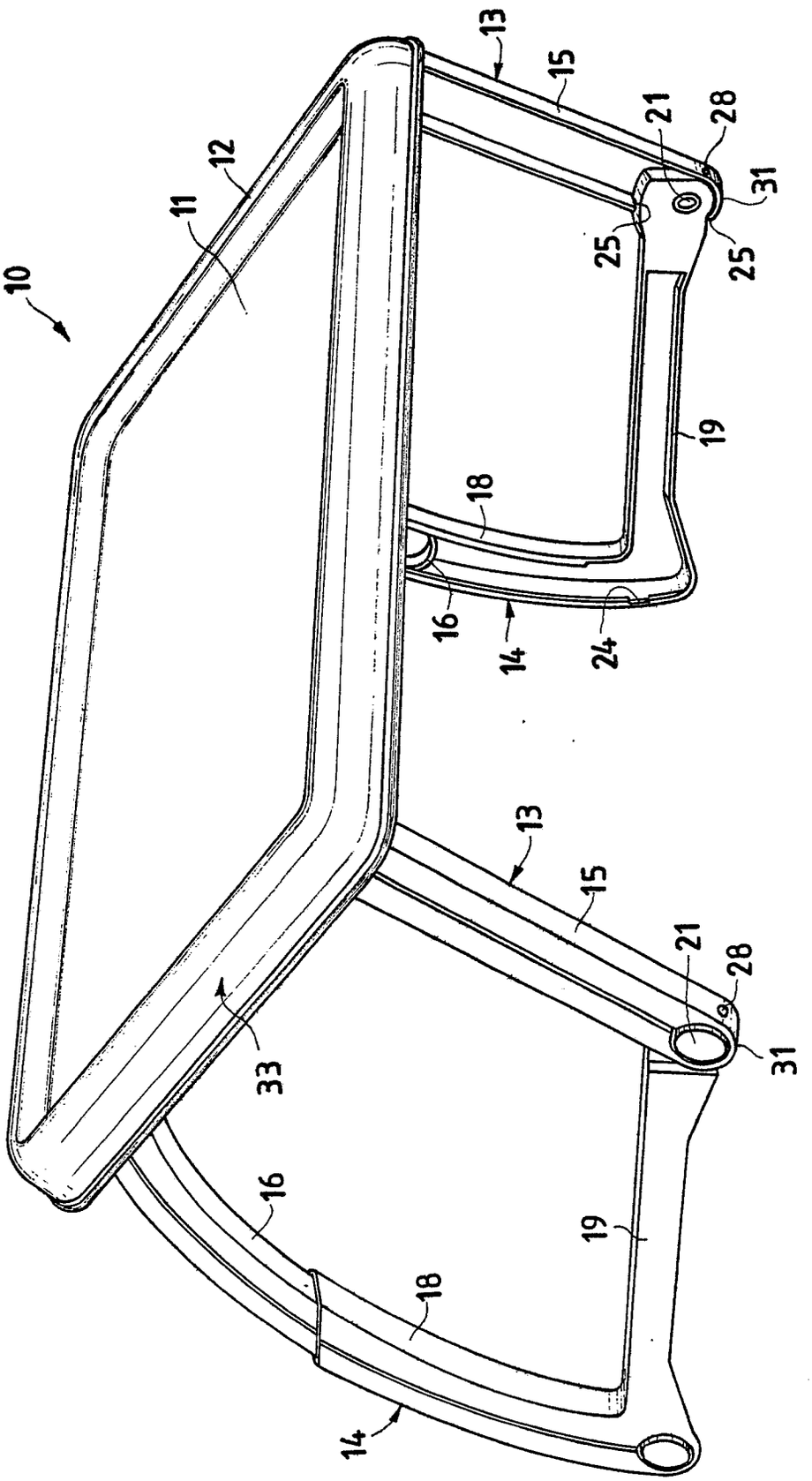
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Fig.4

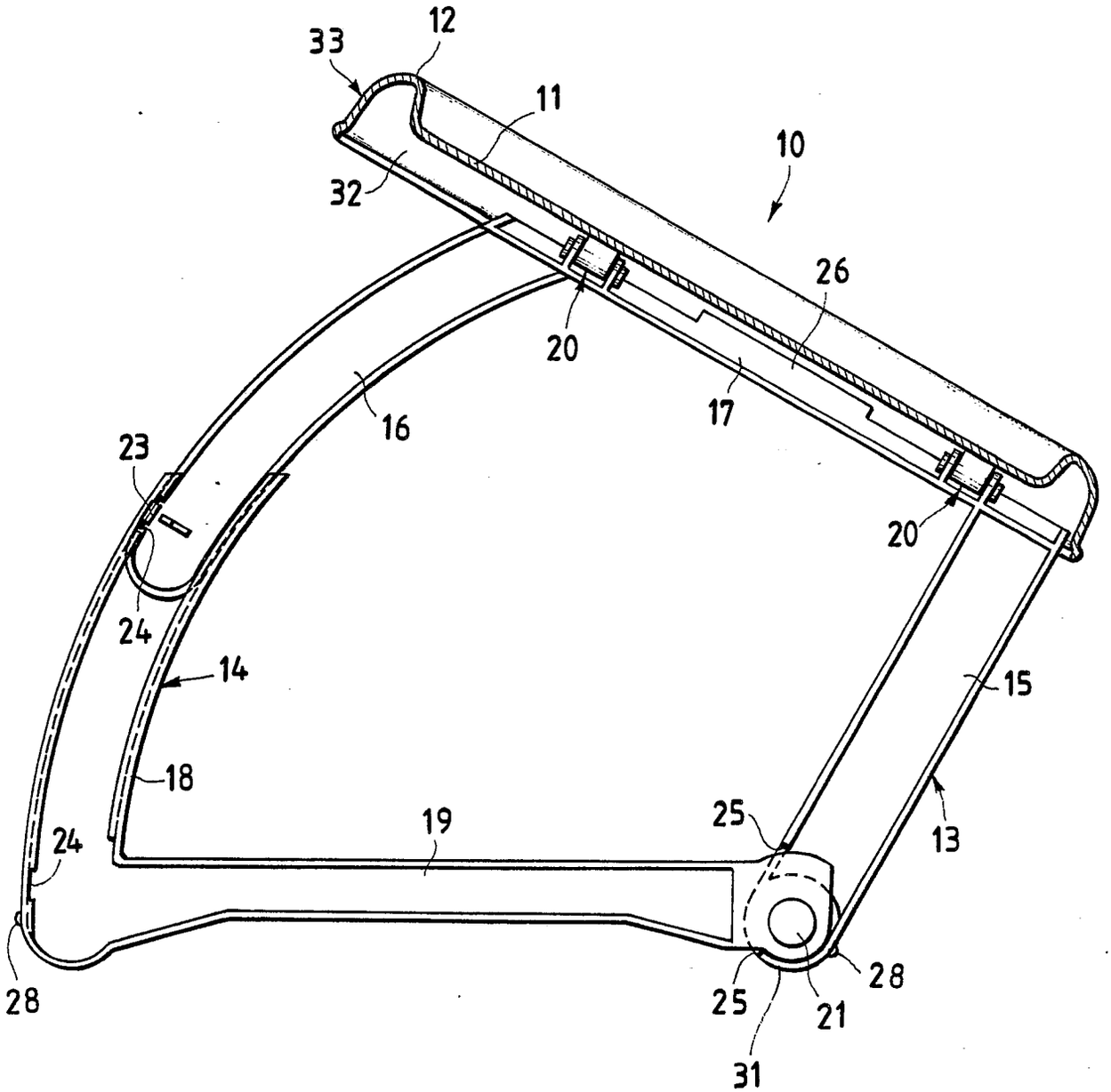


Fig.5

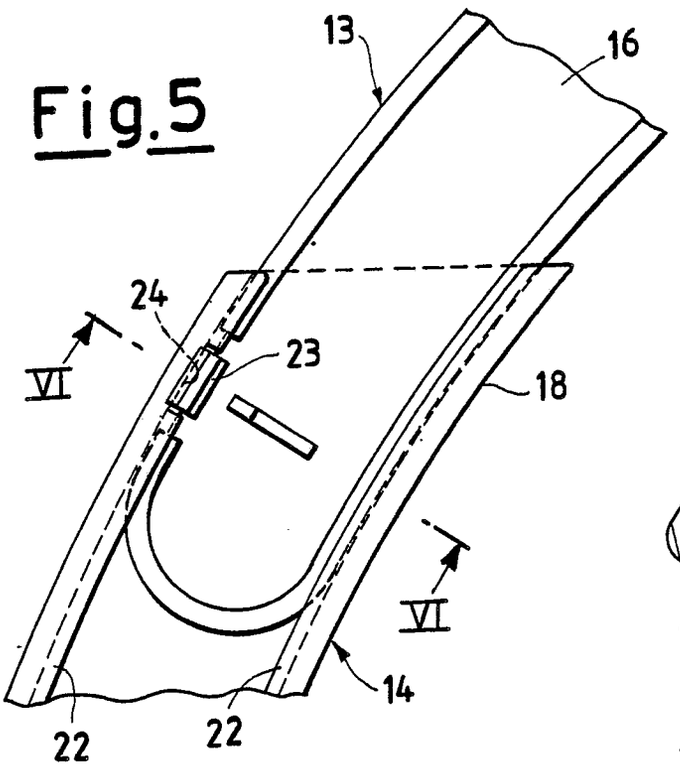
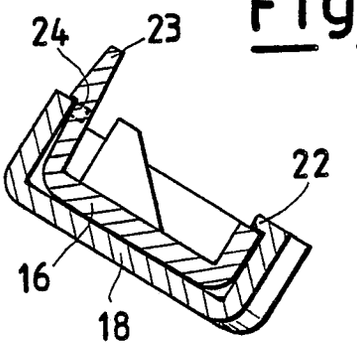


Fig.6



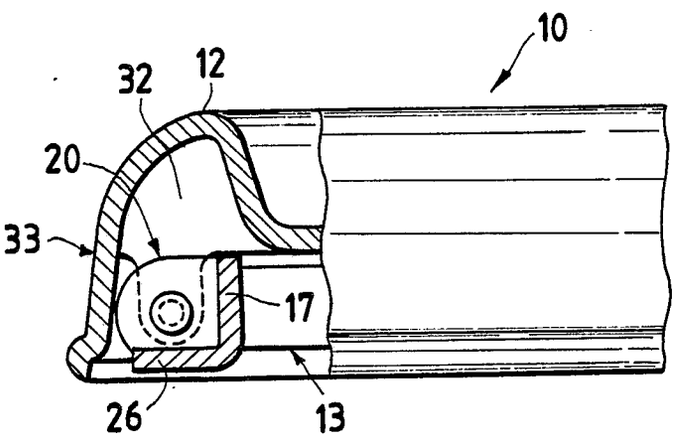


Fig.8

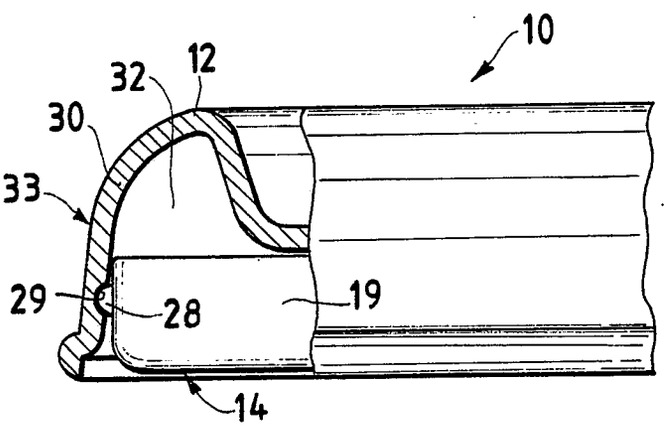


Fig.9

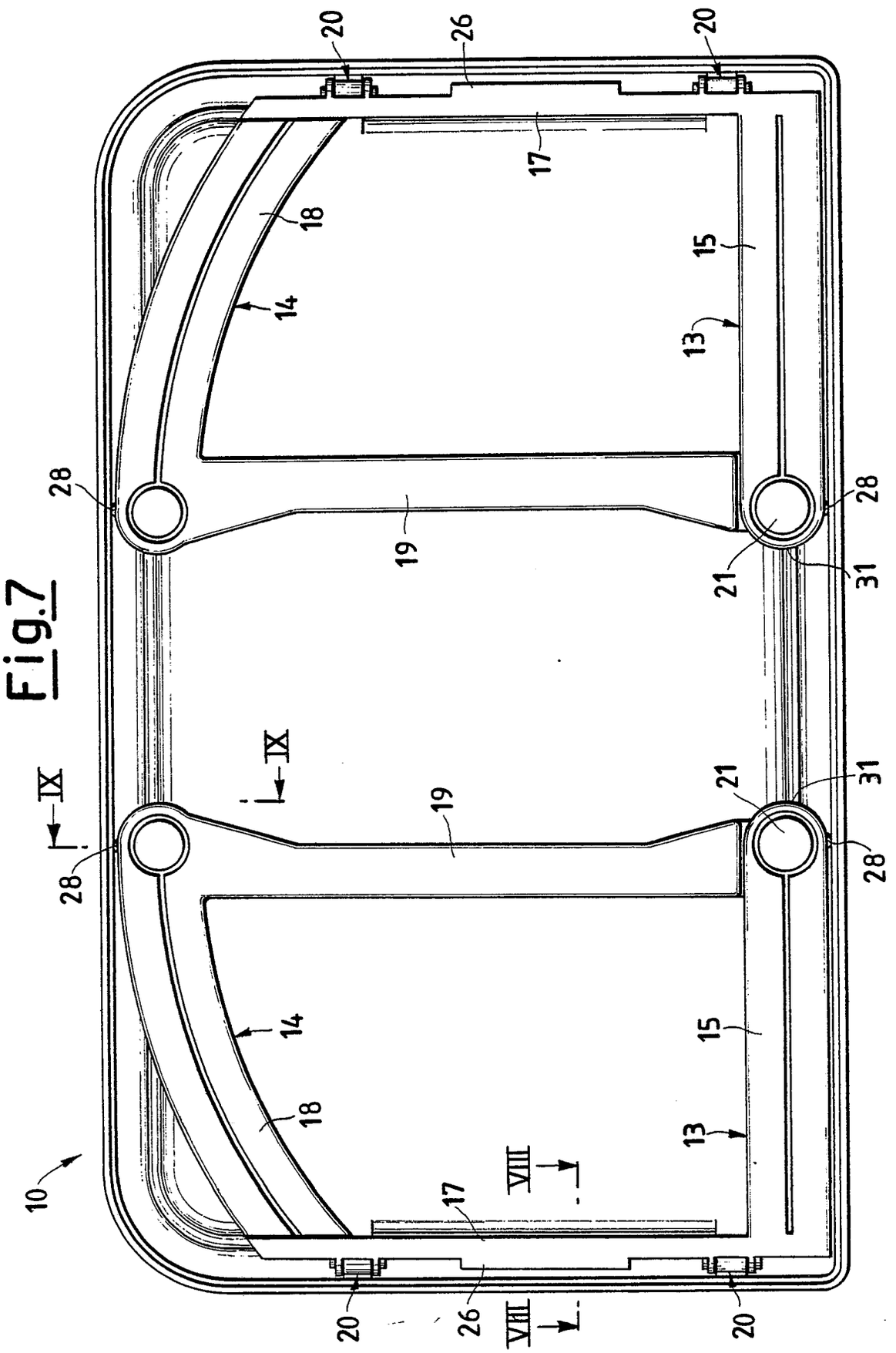

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Fig.7

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EUROPEAN SEARCH REPORT

Application Number

EP 89 20 2015

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.5)
X	CH-A- 322 934 (STÜBI) * Whole document *	1,2,8-11,23-24	A 47 B 23/00
Y		3-7,12-14,19	
Y	US-A-1 381 477 (LAURI) * Whole document *	3-7,12-14,19	
A	BE-A- 481 424 (JOORIS) * Page 5; figures 4,6,7 *	17,18	
A	DE-A-3 011 270 (GASPAR) * Whole document *	8-16,20-22	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A 47 B
B 43 L
A 61 G
F 16 M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	31-10-1989	OFFMANN P.A.

CATEGORY OF CITED DOCUMENTS

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