

UMBRELLA FRAME WITH A MECHANISM FOR LOCKING AND
RELEASING A SLIDER.

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The invention relates to an umbrella frame (hereinafter referred to as of the kind described) having a framework for supporting a canopy and a mechanism for locking and releasing a slider which
10 slides along a stick upon opening and closing of the framework, and which is fixable in the closed position of the frame by means of a latching member engaging in a notch and being releasable from the notch by manual means.

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It has hitherto been known to equip shortenable and non-shortenable umbrellas, which may be opened and/or closed manually or automatically, with such slider-latching mechanisms. Such mechanisms have, for example, spring-loaded latching levers, or
20 latching members which may be released manually by means of handles fitted to them, or else via handles which are coupled through suitable geared means indirectly to the latching member. The latching members are usually arranged either in the umbrella stick or in the umbrella slider and cooperate either
25 with a notch in the slider or stick as shown, for example, in CA-A-840,757 or US-A-2,725,888. All of the umbrellas known hitherto having such mechanisms require space for arranging them within the umbrella stick or else at least opening or slitting of the wall of the umbrella stick near to the lower end. These requirements weaken the umbrella stick and make the stick accessible in its interior to injurious
30 corrosive influences and furthermore require space for accomodating driving parts just where it is often not available, for example, in the case of self-opening or self-closing umbrellas.
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The object of the invention is to create an umbrella of the kind described having a mechanism which latches and releases the slider, and which, for its accomodation or operation, does not require any space in the stick or an opening or slit in the wall of the stick.

This problem is solved in accordance with the invention if the latching member consists of a bolt which is carried by a handle at a lower end of the stick and has a ring part surrounding a guide sleeve of the slider in the closed position and engagable in a notch in the guide sleeve, the bolt being disengagable from the guide sleeve upon being slid transversely to the axis of the umbrella stick against spring action.

An umbrella frame is thereby created, of any shortenable or non-shortenable construction, having for the latching and release of the umbrella slider in the closed position of the umbrella canopy a mechanism which, for its arrangement and operation, needs neither a catch in the umbrella stick nor space for it. The stick is not thereby weakened in its bottom portion through slits for catches or the like, or exposed through them to corrosive influences in its interior. Furthermore the whole cavity in the bottom region of the stick is free from components of the slider latching, so that this free cavity is available, if necessary, for the arrangement of components necessary for other purposes, for example, for incorporating an opening spring for the telescopic stick of a self-opening umbrella.

The invention is explained in greater detail by way of two examples with reference to the accompanying drawings, in which:-

Figure 1 is a diagrammatic side view of an umbrella of automatically opening construction, in the opened state;

Figure 2 is a view corresponding to Figure 1 but partially sectioned and with the umbrella in the closed state;

Figure 3 is an enlarged axial section through the bottom part of the umbrella;

Figure 4 is a section taken on the line A-B in Figure 3;

Figure 5 is a view corresponding to Figure 2 but with the umbrella in the nearly closed state;

Figure 6 is a view corresponding to Figure 5 but with the umbrella in the fully closed state; and,

Figure 7 is an enlarged axial section of the bottom part of the second example of umbrella.

Figures 1 to 6 show, by way of example, an umbrella of shortenable and self-opening construction but the invention is also applicable to any other construction of umbrella of non-shortenable or shortenable type which is opened and/or closed manually or automatically, provided that a mechanism is required for the latching and release of a slider in the closed position of the umbrella canopy. Thus the stick too of such an umbrella may at option be telescopic in a number of parts or else be in only one piece and rigid.

The illustrated umbrella has a handle 1 at the bottom end of a telescopically shortenable stick 2. The handle 1 is fixed to a bottom member of the stick, i.e. to a piece of tube 2a forming a lowermost stick part, which is received in a piece of tube 2b forming a next lowermost stick part, which in turn is received in a piece of tube 2c. The pieces of tube 2a, 2b and 2c of the stick may be received in one another so as to be secure against relative turning by means of hexagonal cross-sections (Figure 4) or, in the case of a round cross-section, by means of longitudinal guide grooves, and in their pulled-out and/or pushed-together positions are secured with

respect to one another by catches 3, 4 and 5. The catch 3 secures the piece of tube 2a in the pushed-in position in the piece of tube 2b, the catch 4 secures the piece of tube 2b in the piece of tube 2c in the pushed-in position and the catch 5 secures the piece of tube 2c in the pushed-out position to the piece of tube 2b. A plug 6 seated at the top end of the piece of tube 2b has an annular shoulder 6a so that the pieces of tube 2b, 2c cannot be separated from one another. The piece of tube 2a ends at an edge 2a' in the piece of tube 2b and the piece of tube 2c reaches at its bottom edge 2c' into the handle 1 in the closed position. At the top end of the piece of tube 2c is seated a crown 7. Onto the latter as well as onto crowns 8a and 9a of two sliders 8 and 9, which are able to slide up and down the stick 2, are hinged in a star-shaped arrangement, a ring of canopy spokes 11a, 11b, 11c supporting a fabric canopy 10 and their struts 12a, 12b, the spokes and struts forming a framework..

Kinematically, this framework is automatically opened, and at the same time the stick 2 is automatically telescoped out, by a compression spring 13, which is stressed between the crown 7 and the piece of tube 2b and tries to force the pieces of tube 2b and 2c apart, and by the sliders 8, 9, which are loaded against one another by a further compression spring 14 and thus have the tendency to be forced upwards as soon as a release button 15 is pressed in transversely, i.e. radially, to the axis X of the stick in the direction of the arrow 16 (Figures 1, 4). The release button 15 is a finger- or thumb-actuated part of a bolt 18 of a mechanism for the latching and release of the slider 8 in the closed position of the umbrella canopy (Figures 2-5). The bolt 18 is supported so as to be able to slide transversely to the axis X of the stick against

the action of a spring 17 inside a portion 1a of the handle 1.

5 The bolt 18 has a ring part with an oval opening 18a surrounding a guide sleeve 8c of the slider 8 as well as the pieces of tube 2a and 2b, with a corresponding clearance near the release button 15, the bolt sliding in a bearing in a slide channel 1a" in the portion 1a. The slide channel 1a" has a clearance 18b corresponding to the clearance in 10 the oval 18a, as well as stop corners 1a"' for engaging stop edges 18c on the bolt 18 (Figure 4). In this way a latching nose 18d of the bolt 18 engages, under the action of the spring 17, in a latch opening or notch 8b in the guide shank 8c of 15 the slider 8 in the closed position of the umbrella canopy in readiness for release of this latch mechanism, and may be slid by means of the release button 18, against the spring action in the direction of the arrow 16 and thereby disengaged out of the 20 latch opening 8b in the slider 8, with the result that the slider 8 and the slider 9 are released and, under the action of the spring 14, move upwards along the stick 2 in the opening direction. In doing so the sliders 8, 9 slide over the stick catch 4, so that 25 it gets pressed in sufficiently for the two pieces of tube 2b and 2c to be freed for telescoping apart under the action of the spring 13.

The portion 1a of the handle 1 supporting the bolt 18 is fixed to the piece of tube 2b by a pin 19 30 and is thereby connected to the piece of tube 2b so as to move with it. The bottom part of the handle 1 has a cavity 1" conforming to the contour of the portion 1a and forms a grip sleeve 1', in which the lower end of the piece of tube 2a is fixed, and 35 which, upon the sliding of the piece of tube 2a into the piece of tube 2b in the direction of an additional shortening of the umbrella stick, may be

pushed over the portion 1a as well as over the slider 8 as shown in Figure 2. With this telescopic handle arrangement is associated a springy latching hook 20, which is fixed in the piece of tube 2a, and secures the portion 1a against separation from the grip sleeve 1', irrespective of the pulled-out position of the piece of tube 2a from the piece of tube 2b. The arrangement of this mechanism is only possible because, for the arrangement and construction of the mechanism 15-18 for the latching and release of the slider 8, no space or corresponding deformations are necessary in the stick 2. Consequently instead of the telescopic handle arrangement, or instead of the latch 20 one might obviously, for example, also build a spring element for the telescoping of the pieces of tube 2a, 2b into the aforesaid free space.

The latching hook 20 is fixed into the piece of tube 2a by means of a claw 20' and, after the umbrella has been closed by pulling down the slider 8 by hand, with consequent latching by the catch 4 of the two pieces of tube 2b, 2c loaded against one another by the spring 13, without any outlay upon additional components, that is, by the means already available as well as without the observance of any extraordinary conditions of operation, the hook is released to allow additional shortening of the umbrella. Unintentional actuation of the release button 15 and opening of the umbrella, is also avoided as the grip sleeve 1' is slid over and covers the button and the portion 1a as well as the slider 8, as shown in Figure 2.

The set of canopy spokes, and their struts, because of their unavoidable compressive and tensile stresses do not exactly, upon closing the umbrella become nicely bundled against the stick 2, parallel to the stick, and resting appropriately against it, but retain a certain residual spread away from the

stick 2 at, say, at an angle of kink α (Figures 5, 6). The user of the umbrella for his part eliminates this residual spread uniformly without any special observance of an instruction, by clasping the set of canopy spokes with the folded canopy 10 and pressing them together so that a bundling and folding of the umbrella in parallel with the stick, ready to go in its sheath, comes about. In the course of this uniform bundling by hand the set of canopy spokes, with the canopy 10, get pressed together towards the axis X of the stick in the direction of the arrow 21 (Figure 6) to run in parallel with the stick 2, with accompanying increase in the residual angle of kink and in compensation gets stretched or elongated a little in the direction of the handle 1 i.e. in the direction of the arrow 22. The sliders 8 and 9 connected to the set of canopy spokes carry out this stretching or elongation with them, with the result that the slider 8 lying with the end 8d of its guide sleeve 8c in front of a latching nose 20" rides over latching nose 20" and forces the latter so far into the piece of tube 2a that the latching nose 20", upon pushing the grip sleeve 1' upwards, no longer engages in the latch openings 2a", 2b" in the pieces of tube 2a, 2b so as to lock them, but with the aforesaid upwards push slides during the nesting of the piece of tube 2a in the piece of tube 2b inertly against the inner wall of the latter until a ball 3a of the catch 3 drops into a notch in the piece of tube 2b and the nesting of the piece of tube 2b ends up in a position corresponding with that shown in Figure 2. As may further be seen from that, through the sliding of the grip sleeve 1' over the parts 1a and 8, the release button 15 is completely enclosed, i.e. concealed from any contact, and in this way release of the umbrella by mistake is quite impossible. This is possible again only when the

grip sleeve 1' is pulled downwards again during the course of elongation of the stick. In doing so the piece of tube 2a, together with the latching hook 20, get pulled out of the piece of tube 2b until its latching nose 20" again snaps through the latch openings 2a"', 2b"' and thus the pieces of tube 2a and 2b pulled out with respect to one another get latched together and at the time the slider 8 and the portion 1a of the handle with the release button 15 become exposed again ready for release, corresponding with the position shown in Figures 1 and 3 to 6.

The mechanism described above for the latching and release of the slider 8 in the closed position of the umbrella is thus a mechanism which, without any involvement of space for arrangement or refinements in or on the stick 2, is realized through a direct latching and release between the handle 1 and the slider 8. Since this latching may be realized without dependence upon any particular shortenable or non-shortenable construction of umbrella, it may, for example, be utilized in combination with a simple non-telescopic handle 1 or a one piece non-telescopic stick 2, corresponding with the example shown in Figure 7. In the latter the same reference numbers apply to the same parts as in the Figures 1 to 6 example. A like transverse bolt 18 may be actuated here too transversely, i.e. radially, to the axis X of the stick 2 by means of a release button 15, so that here too through the arrangement of the bolt 18 on the handle 1, and through its surrounding, in the form of a ring, the guide sleeve 8c of the slider 8, as well as through its engagement in the latch opening 8b on the guide shank 8c, a direct latching of the slider 8 onto the handle 1 results without any involvement of the stick 2. The bolt 18, supported to be able to slide in the slide channel 1a", is held by a wire spring 17 with the latching nose 18d

engaged in the latch opening 8b and hence may be disengaged against spring pressure. The handle 1 may consist of two parts, namely, a bottom part 1^o and a top part 1^{oo}, where these two parts may be so
5 designed that they are connected together separably by means, for example, of snap noses or edges 1^o or other suitable detachable means of connection, in order to be able to define between them the slide channel 1a" and to mount the bolt 18 and the spring
10 17 to be easily accessible.

In order that the slider 8, during the course of the closing i.e. folding together of the umbrella, out of the open state of the umbrella in accordance with Figure 1, may run with less friction of the
15 guide sleeve 8c into the portion of handle 1a, i.e. into the top part 1^{oo}, the annular channel 1" in this portion of handle, which receives the guide sleeve 8c, may be provided with a funnel-shaped entry
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CLAIMS

1. An umbrella frame having a framework for supporting a canopy, and a mechanism for latching and releasing a slider which slides along a stick upon opening and closing of the framework, and which is fixable in the closed position of the framework by means of a latching member engaging in a notch and being releasable from the notch by manual means;
5 characterized in that the latching member consists of a bolt which is carried by a handle at a lower end of the stick and has a ring part surrounding a guide sleeve of the slider in the closed position and engagable in a notch in the guide sleeve, the bolt
10 being disengagable from the guide sleeve upon being slid transversely to the axis of the umbrella stick against spring action.
2. A frame according to claim 1, characterized in
20 that the bolt is guided between two parts of the handle which are detachably connected together.
3. A frame according to claim 1, characterized in that the bolt is mounted in a first portion of the
25 handle, over which a second portion of the handle, in the form of a grip sleeve, may be slid to cover the bolt.
4. A frame according to claim 3, characterized in
30 that the first portion of the handle is provided with an annular channel for receiving the guide sleeve of the slider and with a funnel-shaped entry for guiding the guide sleeve centrally into the annular channel.
- 35 5. An umbrella frame, substantially as described with reference to Figures 1 to 6, or to Figure 7, of the accompanying drawings.



6. An umbrella having a canopy supported by a frame according to any one of the preceding claims.

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