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"Mine-Sowing Device for Aircraft"

The present invention relates to a mine-sowing device for aircraft, particularly helicopters, of the type comprising a plurality of mine magazines housed in a cage-like frame.

5 It is known to effect rapid sowing of mines using a helicopter equipped with a mine-sowing device. A known mine-sowing device consists of magazines housed vertically in a frame; each magazine has an open bottom closed by a door, and contains mines stacked
10 one above the other. These doors can be opened on command to allow the mines held in the magazines to fall out.

It can happen that, as they fall out, one or more mines become jammed, creating a notoriously dangerous
15 situation. With known mine-sowing devices the pilot has no alternative but to jettison the entire mine-sowing device. Even if jamming of one or more mines is not very probable, it is nevertheless apparent that solving the problem by jettisoning the entire
20 mine-sowing device is decidedly uneconomic.

The fundamental problem of this invention is, therefore, that of providing a mine-sowing device in which, in the event of jamming of a mine, it is possible to free the jammed mine without jettisoning
25 the entire mine-sowing device.

This problem is resolved, according to the present invention, by a mine-sowing device of the aforesaid type, in which the magazines are hung in the frame on at least one support of the retractable kind,
30 carried by the said frame, each said support being movable between a first state, in which it supports

the magazines hung upon it, and a second state in which it leaves the magazines free to fall out of the frame, removable means being provided for holding each said support in the first state.

- 5 In this manner, instead of jettisoning the entire mine-sowing device, only that magazine in which jamming has occurred and any other magazines hung on the same support are released.

- Further characteristics and advantages of the
10 invention will emerge from the following description of a preferred embodiment, given with reference to the accompanying drawings, in which:

- Figure 1 is a perspective view, diagrammatically transparent and partly cut away, of a mine-sowing
15 device according to the invention;

Figure 2 is a fragmentary side elevational view, partially in section, of a detail of the mine-sowing device of Figure 1 in a first operational state;

- Figure 3 is a cross section of the detail of
20 Figure 2 taken along the line III-III;

Figure 4 is a fragmentary side elevational view, partially in section, of the detail in Figure 2 in a second operational state; and

- Figure 5 is a cross section of the detail of
25 Figure 4, taken along the line V-V.

The illustrated mine-sowing device consists of a frame 1 containing a plurality of identical vertical magazines 2, arranged in an orderly manner in parallel rows.

- 30 Each magazine 2 in turn contains a plurality of mines 3 stacked vertically one above the other. Each

magazine 2 has an open bottom 4 which is closed by a conventional door 5, openable upon command. In correspondence with each door 5 there is a respective safety lever 6. All the safety levers 5 6 are controlled in a traditional manner known per se, for example by means of a motorised shaft 7 for each row of magazines 2.

Onto the frame 1, above each row of magazines 2, there is fixed a respective casing 8 of substantially 10 tubular form with square cross-section.

Each casing 8 carries at least one retractable support 9 for the magazines 2. Each support 9 includes a pair of bars 10 with flat cross-section; the said bars 10 are arranged horizontally side-by-side, parallel to the casing 8 and are hinged to it 15 along longitudinal axes by means of lugs 11 fixed to the casing 8 and lugs 12 fixed to the bars 10, interconnected by pins 13. Each support 9 is thus movable between a first state in which each bar 10 is horizontal 20 (Fig. 3), and a second state in which each bar 10 is inclined to the horizontal about the pin 13 (Fig. 5).

Each support 9 also includes removable means for holding it in its first state. More particularly, these means consist of a tubular body 14 fixed to the casing 8; 25 within this body 14 there is movably guided in the vertical direction a cylindrical pusher 15, provided at its lower end with a frusto-conical head 16, projecting from the body 14.

The head 16 is engaged with the respective pair 30 of bars 10, more particularly with two inclined lateral surfaces 17, one for each bar 10, facing each other;

each surface 17, when the support 9 is in the first state with the bars 10 horizontal, has the same inclination as the frustoconical surface of the head 16.

The pusher 15 is held in a lower position, against the 5 bars 10, by a trigger 18 mounted rotatably on the body 14 by a pin 19. A spring 20, housed in the body 14, urges the pusher 15 downwards, and the trigger 18 is thrust into engagement with the pusher 15 by a torsion spring 21, abutting against a 10 shoulder 22 on the body 14. The trigger 18 is disengaged from the pusher 15 by the action of an electromagnet 23, fixed to the casing 8.

All the supports 9 carried on the same casing 8 have their pairs of bars 10 aligned so as to form a sort 15 of double track guide.

Each support 9 supports at least one magazine 2, by means of hook-like hangers 24 which are hung on the bars 10. In the example illustrated each casing 8 carries three supports 9, onto each of which are 20 hung two magazines 2.

The operation of the mine-sowing device described is as follows.

Under normal conditions the supports 9 will be in the first state with the bars 10 in the horizontal position 25 and supporting the hanging magazines 2 by means of the hangers 24. The bars 10 cannot rotate around the pins 13 because they are prevented from doing so by the pusher 15, locked in its lower position by the trigger 18. In this position all the normal 30 operations for sowing the mines 3 can be carried out, in an entirely conventional manner. This state is

illustrated in Figs. 1, 2 and 3.

If, at a certain point, a signal is given that in one of the magazines 2 a mine 3 has jammed, the pilot can proceed to jettison the magazine 2 in question. In order to do this it suffices to energise, by wholly conventional means, the release electromagnet 23 of the support 9 of the magazine 2. The trigger 18 is removed from engagement with the shoulder 22, freeing the pusher 15; with the pusher 15 free, the bars 10 are easily able to rotate under the weight of the magazines 2 hung on them, lifting the pusher 15 against the action of the spring 20, by virtue of the engagement of the lateral surfaces 17 with the frusto-conical head 16. This rotation causes disengagement of the hangers 24 and hence allows the magazines 2 supported by the hangers 24 to fall. This fall is not impeded by anything, since in this phase naturally the safety levers 6 are lowered. This state is shown in Figures 4 and 5.

In an immediately subsequent phase, after the magazines 2 have been jettisoned, the spring 20 returns the pusher 15 to its lower position, returning the bars 10 to the horizontal position. When the pusher 15 has reached its lower position, the trigger 18 can also return to its previous position into engagement with the shoulder 22, urged by the torsion spring 21.

In the example illustrated, since each support 9 carries two magazines 2 including the jammed magazine 2 a non-jammed magazine is also jettisoned. Naturally a different subdivision can be chosen, for example with a single, or alternatively several, magazines for each support. The choice in this sense is purely of an economic nature, bearing in

mind that the cost of the mine-sowing device increases as the number of supports increases. Given the present probabilities of jamming, the most suitable subdivisions appear to be those with 5 two or three magazines per support 9.

A mine-sowing device according to the invention thus completely resolves the technical problem explained at the beginning of the specification. It has moreover, a further advantage; it is to be noted in fact 10 that the operations of preparing the armament are especially simple. In fact, in order to place the magazines 2 in position it suffices to insert them laterally, hanging them on to the guides formed by the supports 9, and to slide them up to their 15 position. This operation is obviously a great deal simpler and speedier than that necessary with known mine-sowing devices, in which each magazine has to be fixed in the frame.



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CLAIMS

1. A mine-sowing device for aircraft, comprising a plurality of mine magazines housed in a cage-like frame, in which the magazines are hung in the said frame on at least one support of the retractable
5 kind, carried by the said frame, the said support being movable between a first state in which it supports the magazines hanging upon it, and a second state in which it leaves the magazines free to fall out of the frame, removable means being provided for
10 holding each support in the said first state.
2. A mine-sowing device according to Claim 1, in which the or each support comprises a pair of bars hinged to the said frame, on to which the magazines are hung by hook-like hangers.
- 15 3. A mine-sowing device for aircraft, comprising a plurality of mine magazines housed in a cage-like frame, arranged in an orderly manner in a vertical position, in parallel rows, in which the magazines are hung in the said frame on a plurality of supports
20 of the retractable kind, carried on the said frame, each of the said supports being movable between a first state in which it supports the magazines hanging on it, and a second state in which it leaves magazines free to fall out of the frame, removable means being
25 provided for holding each of the supports in the first state, each of the supports comprising a pair of bars, hinged to the said frame, onto which bars the magazines are hung by hook-like hangers, the supports relating to magazines of one and the same row having
30 their pairs of bars aligned to form a double track guide.



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4. A mine-sowing device according to Claim 2 or Claim 3, in which the removable means for holding the support in the first state consist of a body fixed to the frame, a pusher guided movably within the said body from a lower position in which it locks the bars to an upper position in which it leaves the bars free to rotate, a trigger engaging the said pusher to hold it in its lower position, and an electromagnet for disengaging the trigger from the pusher.
5. A mine-sowing device for aircraft, substantially as herein described with reference to and as shown in the accompanying drawings.
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