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(11) **EP 1 001 129 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.05.2000 Bulletin 2000/20

(51) Int Cl.7: **E06B 9/68**, E06B 9/18,
E06B 9/08, E06B 3/66

(21) Application number: **98203761.6**

(22) Date of filing: **09.11.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Vervaeke, Geert**
8755 Ruisselede (BE)

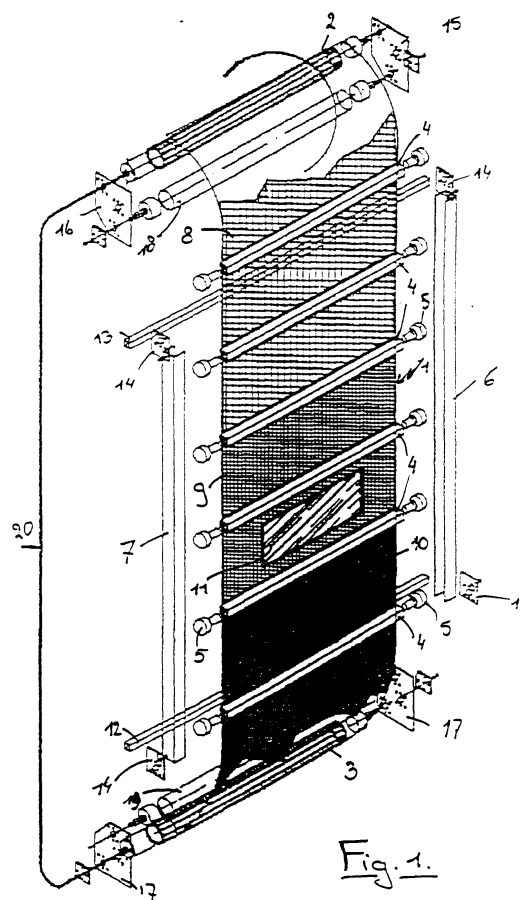
(74) Representative: **Leherte, Georges, Dr.**
Bureau Vander Haeghen - K.O.B. S.A.,
Pres. Kennedypark 31 c
8500 Kortrijk (BE)

(71) Applicant: **Vervaeke bvba**
8755 Ruisselede (BE)

(54) **Device for providing weather protection**

(57) The invention relates to a shielding device, comprising means for unrolling and rolling a protective sheet (1) from, respectively on, two winding bodies (2,3), and means for maintaining the unrolled sheet (1) substantially flat between said two winding bodies (2,3), wherein the means for unrolling and rolling the protective sheet (1) comprise a separate hydraulic motor (M) acting on each winding body (2,3), and a regulation system causing the hydraulic motor (M) of a winding body (2,3) to perform a driving action when said winding body (2,3) is rolling up the protective sheet (1) and causing the motor (M) of a winding body (2,3) to perform a braking action when said winding body (2,3) is unrolling the protective sheet (1).

The regulation system may comprise hydraulic pumping means, hydraulic circuitry and hydraulic regulation valves.



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Description

[0001] This invention relates to a device for shielding off wheather conditions, such as for shielding off rain, cold, wind or sun, for instance in or around constructions having open access to the outside.

The expression "having open access to the outside" refers to those constructions where proper ventilation is achieved by leaving large openings in the outer walls of the construction or even by deleting (part of) those outer walls, such as in particular with large stock and/or cattle breeding buildings, where such open access is required by regulation.

[0002] In order to provide adequate wheather protection for such large open access buildings, there already exist known devices for rolling and unrolling a protective textile or canvass in front or behind said open accesses. Such devices are for instance commercialized by the companies "GEALBREAKER" in Great Britain and "VERVAEKE" in Belgium. These known devices in particular comprise an upper rotary beam and a lower rotary beam between which the canvass is wound off, respectively wound up, together with the transversal reinforcement profiles which serve to maintain the canvass flat.

[0003] The problem with these known devices results from the fact that the outer diameter of the upper roll and of the lower roll (i.e. the diameter of the beam with the canvass and the reinforcement profiles) are not the same. If the diameter of both empty beams is for instance 100 mm, the diameter of completely wound up beam, with the canvass and the reinforcements, will typically be around 350 - 400 mm. When winding the protective canvass from the one beam on the other, both rotate with a different speed which is constantly changing.

As a consequence, when for instance winding up the canvass on the lower beam, it is very difficult to properly brake the upper beam and the canvass will not be neatly and tightly wound on the lower beam.

A comparable problem occurs also when winding the canvass from the lower beam to the upper beam.

A further problem lies in maintaining a proper and substantially constant tension on the canvass during winding and after winding.

[0004] The purpose of this invention is to provide a shielding device which avoids the problems involved with the known devices, which offers entirely adaptable screening off possibilities for open buildings of any height and length, and which allows to properly stretch the screen and to maintain it properly stretched.

[0005] The invention therefor provides a shielding device, comprising means for unrolling and rolling a protective sheet from, respectively on two winding bodies, and means for maintaining the unrolled sheet substantially flat between said two winding bodies, wherein the means for unrolling and rolling the protective sheet comprise a separate hydraulic motor acting on each winding body, and a regulation system causing the hydraulic mo-

tor of a winding body to perform a driving action when the winding body is rolling up the protective sheet and causing the motor of a winding body to perform a braking action when the winding body is unrolling the protective sheet.

[0006] The use of hydraulic motors is known per se for winding and unwinding the sails of sailing boats, for instance from Dutch patent application 8300665 and from US patent 4.905.922. The specific combination of two hydraulic motors with a regulation system for braking the non active motor, in the specific area of devices for shielding off wheather conditions, is however not suggested in the prior art.

[0007] According to a further feature of the invention, the regulation system of the hydraulic motors preferably comprises hydraulic pumping means, a hydraulic circuit connecting the hydraulic motors and the hydraulic pump, and hydraulic regulation valves on the hydraulic circuit. The regulation system according to this embodiment of the invention most preferably comprises means for controlling the hydraulic regulation valves on the hydraulic circuit. These control means may for instance consist of electric, electro-magnetic, pneumatic or electronic means.

[0008] According to a preferred embodiment of the invention the protective sheet may suitably comprise several (at least two) sections of different types of sheet material.

The sheet material may consist of any flexible surface of textile material, non-woven material and/or foil or film material, or the like; the type of material and its properties (thickness, permeability, opacity, etc.) are thereby selected in function of the ability of the material to partially or substantially reduce the ingress of wind, sun and/or cold, etc., and/or to avoid the ingress of rain in the protected space.

By using two or more sections of different materials it is possible, merely by winding or unwinding the protective sheet to the appropriate section, to easily adapt the shielding properties of the shielding device in function of the period of the day, the wheather conditions and the season.

[0009] According to a further specific embodiment of the invention, the bodies on which the protective sheet are wound may suitably consist of cylindrical beams or tubes.

[0010] According to still a further preferred embodiment of the invention, the means for maintaining the unrolled sheet substantially flat may suitably comprise tensioning and/or reinforcement bars or profiles provided transversally with respect to the winding direction of the sheet material (i.e. parallel to the winding body or beam on which they are rolled together with the protective sheet).

[0011] Further features and specific aspects of the invention, as well as the use thereof, will become apparent from the following description of a specific embodiment of the invention, explaining the invention in full detail

with reference to the attached drawings representing that embodiment. It should be observed that the specific aspects of this embodiment are only set forth as preferred examples of what is ment in the context of the above general disclosure of the invention, and should not be interpreted as a limitation of the scope of the invention as such and as expressed in the claims at the end of this specification.

[0012] In the attached drawings :

Figure 1 is a schematic, exploded illustration of a wheather shielding device according to the invention;

Figure 2 is a schematic illustration of the use of several sections of different types of sheet material in a wheather shielding device according to the invention;

Figure 3 is a schematic representation of a hydraulic circuit for a wheather shielding device according to the invention.

[0013] The shielding device shown on figure 1 comprises a protective sheet, globally designated with reference numeral (1), an upper winding tube (2) and a lower winding tube (3) for rolling and unrolling the sheet (1), tensionning and/or reinforcement bars / profiles (4) for maintaining the unrolled sheet substantially flat, and guiding plugs (5) provided to said bars (4) to guide these bars (4) along frame elements (6), (7).

The protective sheet shown on figure 1 comprises three sections (8), (9) and (10) of different sheet material, more specifically a first section (8) of relatively light fabric, a second section (9) of more dense fabric or canvass, shown with a window (11) of transparent film material, and a third section (10) of relatively close and opaque structure.

The frame construction of the device, comprising frame elements (6), (7), is completed by two further frame elements or profiles (12), (13) and four connecting plates (14).

[0014] The winding tubes (2), (3) are supported by support elements (16), respectively (17). These support elements (16), (17) also support guiding rolls (18) respectively (19), for the winding tubes (2), (3).

[0015] The support elements (16), repectively (17), are assembled to the upper, repectively lower connecting plates (14) by means of bolts (not represented), bolted through the holes in plates (16) and (17) and in plates (14).

[0016] The winding rolls (2), (3) are controlled by means of a hydraulic system schematically indicated with reference numeral (20) on figure 1.

[0017] The winding and unwinding of the protective sheet (1), and the purpose of the individual sections (8), (9), (10) of different sheet material of the sheet (1) are further explained having reference to figure 2.

The excess of sheet material with respect to the heigth of the open access to be shielded off, is wound on the

upper tube (2) and/or on the lower tube (3).

[0018] In order to use the lower part of the protective sheet, i.e. a section (10) of relatively closer and/or more opaque structure, the sheet is wound up on the upper tube and unwound from the lower tube. This may for instance be the case in the cold season or at night (situation shown at left on figure 2).

In order to use the upper part of the protective sheet, i.e. a section (8) of relatively light fabric, the sheet is unwound from the upper tube and wound up on the lower tube. This may for instance be the case in the hot season (situation shown at right on figure 2).

The intermediate part of the protective sheet, i.e. a section (9) of intermediate properties between the relatively light fabric of section (8) and the relatively dense structure of section (10), may for instance be used in intermediate situations, such as in the middle seasons (situation shown in the middle on figure 2).

[0019] The hydraulic system (20) controlling the winding and unwinding of the winding tubes (2), (3) is further explained having reference to figure 3.

[0020] The hydraulic system (20) shown in this figure 3 comprises: an oil tank (21) provided with

gauges (22),
a filling pipe / vent (23), and
a filter (24) for the return flow;

a pump (28), such as a CASAPPA type PLP20 gear pump,

connected to a motor (M), through an elastic coupling (26), with
a suction flange (29) and
a pressure flange (30);

a manifold (11), such as a VERMEULEN manifold, with a manometer valve (32),

such as a HYDROFLEX manometer valve, a manometer (33), such as a ERIKS manometer, an excess pressure valve (34), such as from BOSH, an electrovalve (35), such as from BOSH, and a pressure switch (43), such as from BOSH;

and
a manifold block (36), such as a MECABOR MR3-1 manifold, with

an electrovalve (37), such as from BOSH a connecting piece (38),

such as a MECABOR MR.P-3-AB a switching valve (39),
such as a IMAV WRVZ valve, a pressure reducton valve (40),
such as a SUN PBDB-LSN valve, and a pair of hydromotors (41.1) and (41.2),
such as CHAR-LYNN hydromotors, and brakes (42.1) and (42.2),
such as REGGINA-RIDUT brakes.

[0021] For each additional device for rolling and unrolling a protective sheet, an additional separate manifold block (26) can be connected to the manifold (31).

[0022] The excess pressure valve (34) achieves that when for some reason the device becomes blocked the hydromotors will not tear to pieces the various parts of the construction.

[0023] The electrovalve (37) makes the hydromotors turn in one or the other direction. When actuating one of the directions the brakes connected to the hydromotor will be uncoupled via the line indicated in dotted line.

[0024] One motor operates always directly at the pressure of the excess pressure valve (34). This is the hydromotor operating the beam on which the sheet is to be rolled at that moment.

The other motor will receive reduced pressure via pressure reduction valve (40). This is the motor for the sheet which is being unrolled. This creates a braking force so that the sheet remains stretched.

By regulating the pressure reduction on valve (20) one can adequately control the tension on the sheet.

[0025] In operation of the device according to the invention, one hydromotor (41) will be turning while the other motor (41) will serve as a brake.

The braking takes place by braking or restraining the oil circulating in the conducts of the non driven / driving motor by means of a regulation valve, and by circulating said oil.

In this way both hydraulic motors do not have to take account of each others revolution speed.

When none of the motors is in operation a brake is provided to block both winding tubes so that the protective sheet remains properly stretched and under tension.

ing means, and hydraulic regulation valves on said hydraulic circuit.

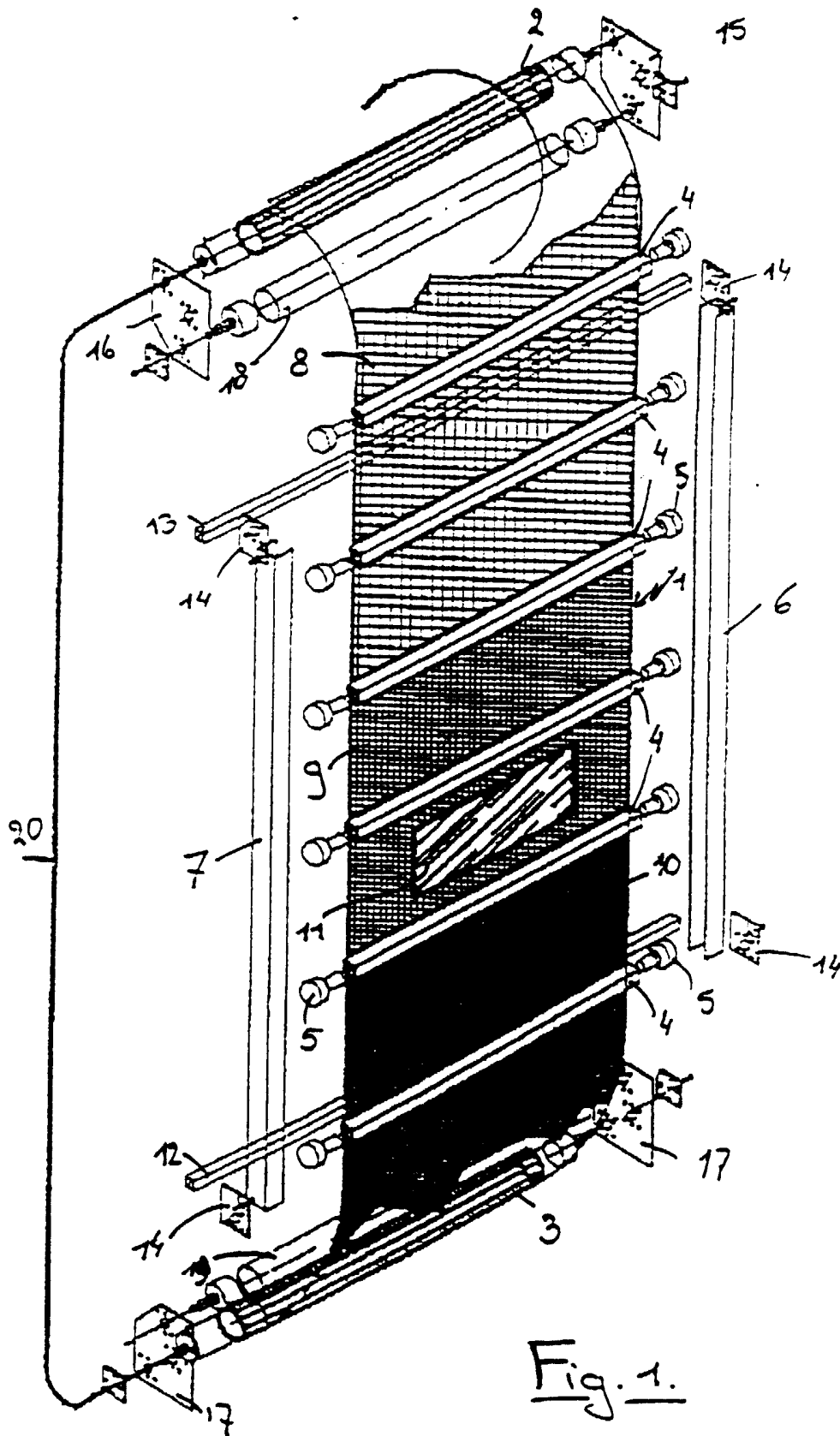
3. Shielding device according to claim 2, **characterised in that** said regulation system further comprises means for controlling said hydraulic valves.
4. Shielding device according to claim 3, **characterised in that** said means for controlling said hydraulic valves are selected from electric, electro-magnetic, pneumatic and electronic means.
5. Shielding device according to any one of the preceding claims, **characterised in that** said device consists of a wheather shield device for buildings with open acces to the outside.
6. Shielding device according to any one of the preceding claims, **characterised in that** said protective sheet comprises at least two sections of different types of sheet material.
7. Shielding device according to any one of the preceding claims, **characterised in that** said winding bodies comprise cylinders or tubes on which said protective sheet can be wound.
8. Shielding device according to any one of the preceding claims, **characterised in that** said means for maintaining the unrolled sheet substantially flat comprise tensionning and/or reinforcement bars provided transversally with respect to the winding direction of the sheet material.

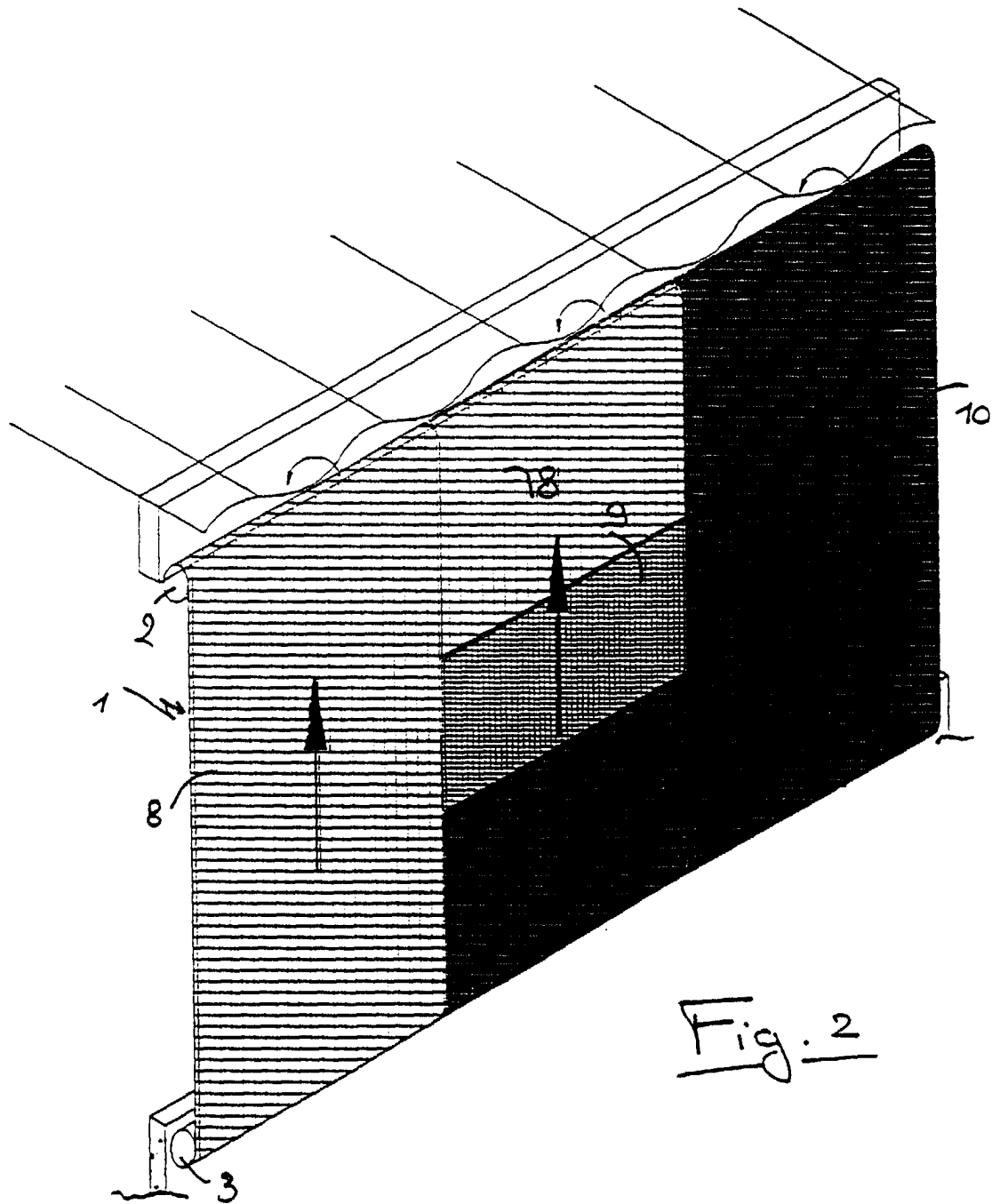
Claims

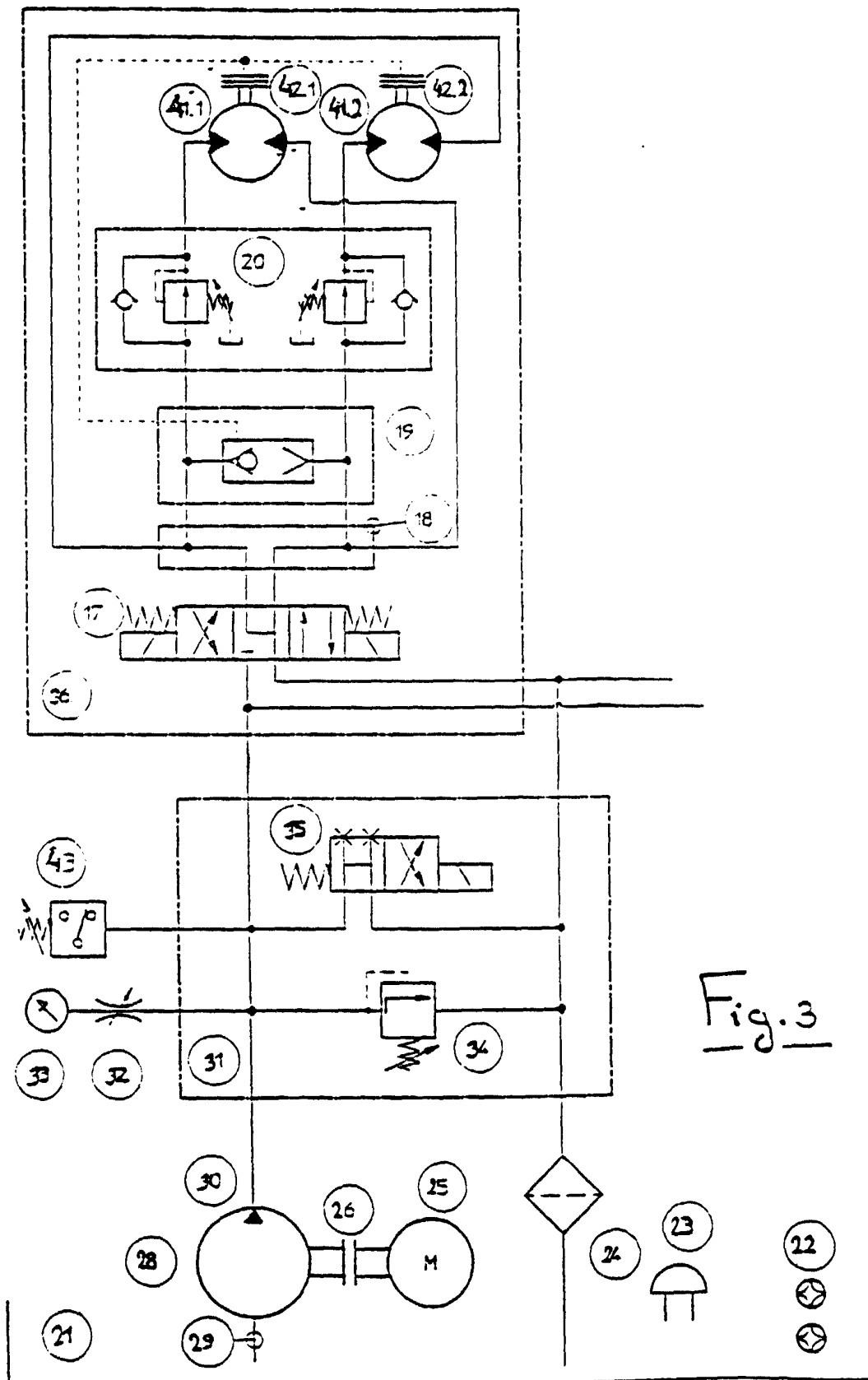
1. Shielding device, comprising means for unrolling and rolling a protective sheet from, repectively on, two winding bodies, and means for maintaining the unrolled sheet substantially flat between said two winding bodies, **characterized in that** the means for unrolling and rolling the protective sheet comprise

a separate hydraulic motor acting on each winding body, and
a regulation system causing the hydraulic motor of a winding body to perform a driving action when said winding body is rolling up the protective sheet and causing the motor of a winding body to perform a braking action when said winding body is unrolling the protective sheet.

2. Shielding device according to claim 1, **characterized in that** said regulation system comprises hydraulic pumping means, a hydraulic circuit connecting said hydraulic motors and said hydraulic pump-









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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 3761

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	EP 0 531 079 A (LUTRON ELECTRONICS CO) 10 March 1993 * abstract; figure 1 * ---	1	E06B9/68 E06B9/18 E06B9/08 E06B3/66
A	DE 34 43 212 A (GEWALD LUDWIG) 28 May 1986 * page 6, line 13 - page 7, line 8; figures 7-9 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 6 April 1999	Examiner Peschel, G
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 98 20 3761

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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