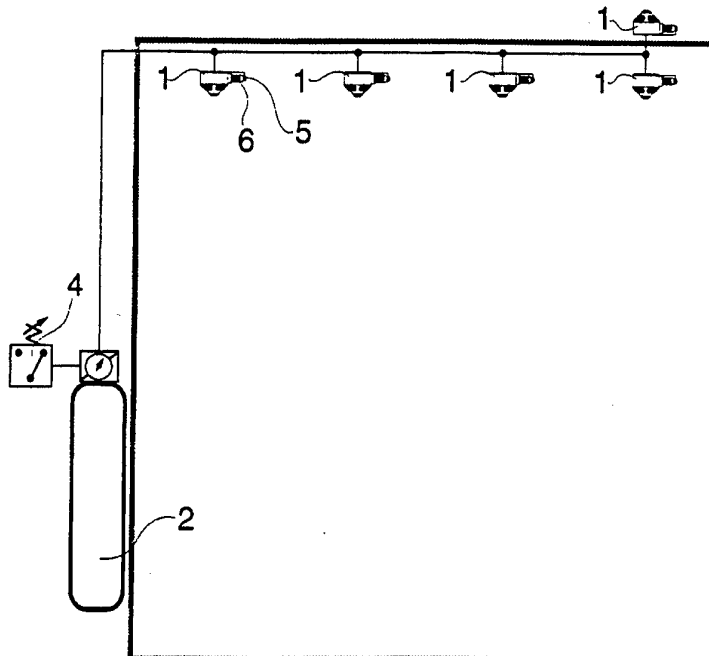




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification<sup>5</sup> : A62C 37/40</p>	<p>A1</p>	<p>(11) International Publication Number: <b>WO 94/16773</b> (43) International Publication Date: 4 August 1994 (04.08.94)</p>
<p>(21) International Application Number: PCT/FI94/00026 (22) International Filing Date: 21 January 1994 (21.01.94) (30) Priority Data: 930234 21 January 1993 (21.01.93) FI (71)(72) Applicant and Inventor: SUNDHOLM, Göran [FI/FI]; Ilmari Kiannon kuja 3, FIN-04310 Tuusula (FI). (74) Agent: VALROS, Frey; Marioff Ky, PB 25, FIN-01511 Vantaa (FI).</p>	<p>(81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report.</i> <i>In English translation (filed in Finnish).</i></p>	

(54) Title: FIRE FIGHTING INSTALLATION



## (57) Abstract

The object of the invention is to provide new equipment for fighting fire, in particular for restaurant kitchens and similar spaces. A number of automatically releasable spray heads (1) are arranged in the space, and at least one high pressure hydraulic accumulator works as drive unit. When one spray head is released because of a fire broken out, the pressure in the accumulator (2) falls as liquid is sprayed. A pressure guard (4) is arranged to at e.g. 75 % of the initial pressure of the accumulator produce a signal to release all spray heads, e.g. by connecting an electric current to heat coils (6) laid around respective release ampoules (5).

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Fire fighting installation

The present invention relates to equipment for fighting fire, in particular for kitchen spaces and the like.

Fires in kitchen spaces, in particular in restaurant kitchens and comparable, with friteuses and other objects liable to fire, are often disastrous.

The object of the invention is to provide new equipment for fighting fire, which is capable of efficiently extinguishing fires in such spaces.

The equipment of the invention comprises a number of preferably automatically releasable spray heads or sprinklers placed at suitable positions and to which extinguishing liquid is arranged to be delivered from at least one hydraulic accumulator preferably having a high charge pressure, e.g. 30-200 bar.

When at least one spray head has been released because of a fire broken out within its action range, the pressure in the hydraulic accumulator starts to decrease as extinguishing liquid is sprayed out of the released spray head. To the hydraulic accumulator is connected a pressure guard which when the pressure in the hydraulic accumulator has decreased to a predetermined value, e.g. 20 bar and 150 bar, respectively, for the exemplifying limit values of 30 bar and 200 bar, respectively, mentioned above, is arranged to produce a signal in order to release also the other spray heads in the space. The pressure guard can also be arranged to produce a signal to disconnect the electric current to cooking apparatuses and others, as well as a signal for fire alarm.

The spray heads are preferably made according to what is described in the International Patent applications PCT/FI92/00060, PCY/FI/92/00155 and PCT/FI92/00156, in order to produce a fog-like liquid

spray with a good penetration power. The drop diameter can preferably be within the interval 30-200 microns.

The release of all spray heads in the space effected by the pressure guard can preferably be  
5 arranged to take place by means of heat coils laid around release ampoules of the respective spray heads.

The initially released spray head, utilizing the full capacity of the hydraulic accumulator, is in general alone capable of extinguishing the fire or at  
10 least of suppressing it; the continued spray of liquid with all spray heads prevents the fire from spreading and reignition and brings about general cooling.

The invention shall in the following be described with reference to a preferred embodiment shown in the  
15 attached drawing.

In the drawing a number of spray heads, most of which usually are positioned at the ceiling of the space, are indicated by the reference numeral 1. Extinguishing liquid is delivered to the spray heads  
20 by at least one hydraulic accumulator 2 via a line 3 in common for the spray heads 1. A pressure guard connected to the hydraulic accumulator 2 is indicated by 4. The release ampoules of the spray heads 1 are indicated by 5 and a heat coil laid around the  
25 respective ampoules is indicated by 6.

The hydraulic accumulator 2 is preferably made according to what is described in the Finnish patent application 924752, with an outlet pipe running within the accumulator and having apertures in its wall, in  
30 order to mix drive gas into the extinguishing liquid as the amount of liquid decreases in the accumulator.

The different electrical coupling included in the equipment do not present difficulties for a person skilled in the art and are therefore not shown in the  
35 drawing.

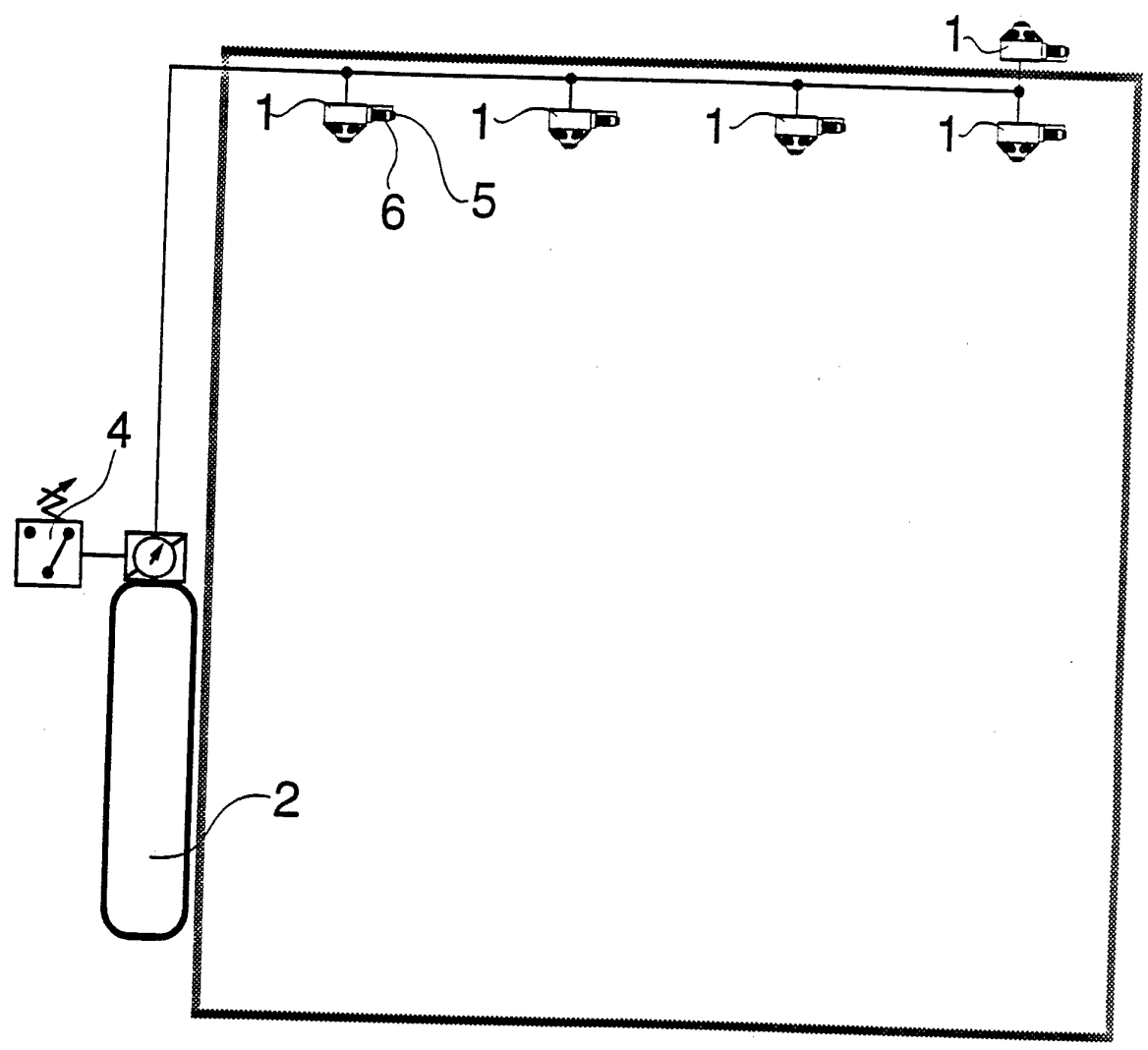
## Claims:

1. Equipment for fighting fire, in particular for kitchen spaces and the like, which equipment comprises a number of preferably automatically releasable spray heads to which extinguishing liquid is arranged to be delivered from at least one hydraulic accumulator with a preferably high charge pressure, characterized in that to the hydraulic accumulator (2) is connected a pressure guard (4) which, after at least one spray head (1) has been released because of a fire broken out within its action range, when the pressure in the hydraulic accumulator (2) has decreased to a predetermined value is arranged to produce a signal in order to release the other spray heads in the space.

2. Equipment for fighting fire, according to claim 1, characterized in that the pressure guard (4) is arranged to produce a signal for disconnecting the current to electrical apparatuses being in the space.

3. Equipment for fighting fire, according to claim 1, characterized in that the pressure guard (4) is arranged to produce a signal for fire alarm.

4. Equipment for fighting fire, according to claim 1, characterized in that the release of all spray heads (1) in the space effected by the pressure guard (4) is arranged to take place by means of a heat coil (6) laid around the release ampoule (5) of the respective spray head.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 94/00026

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC5: A62C 37/40 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC5: A62C		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
WPI		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4359097 (CLAUSSEN), 16 November 1982 (16.11.82), column 4, line 5 - line 9	1
Y	--	2,3,4
Y	US, A, 3866687 (BANNER), 18 February 1975 (18.02.75), column 7, line 62 - line 67, figure 12	2,3
Y	WO, A1, 9215370 (SUNDHOLM, GÖRAN), 17 Sept 1992 (17.09.92), figure 13	4
A	WO, A1, 9220454 (SUNDHOLM, GÖRAN), 26 November 1992 (26.11.92)	
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search		Date of mailing of the international search report
4 May 1994		09 -05- 1994
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86		Authorized officer  Ulrika Öhman Telephone No. +46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 94/00026

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO, A1, 9220453 (SUNDHOLM, GÖRAN), 26 November 1992 (26.11.92)  ---	
P,A	WO, A1, 9310859 (SUNDHOLM, GÖRAN), 10 June 1993 (10.06.93)  -----	

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

16/04/94

International application No.  
PCT/FI 94/00026

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4359097	16/11/82	AU-B- 532489 DE-A, C- 3021753 FR-A, B- 2458296 GB-A, B- 2053542 SE-B, C- 423317 SE-A- 7905190	29/09/83 18/12/80 02/01/81 04/02/81 03/05/82 14/12/80
US-A- 3866687	18/02/75	NONE	
WO-A1- 9215370	17/09/92	AU-A- 1327192 AU-A- 1971492 CA-A- 2111232 EP-A- 0589956	06/10/92 12/01/93 23/12/92 06/04/94
WO-A1- 9220454	26/11/92	AU-A- 1689692 AU-A- 1751092 CA-A- 2103069 CA-A- 2103070 EP-A- 0586426 FI-D- 935108 FI-D- 935109 NO-D- 934172 NO-D- 934173 WO-A- 9220453	30/12/92 30/12/92 21/11/92 21/11/92 16/03/94 00/00/00 00/00/00 00/00/00 00/00/00 26/11/92
WO-A1- 9220453	26/11/92	AU-A- 1689692 AU-A- 1751092 CA-A- 2103069 CA-A- 2103070 EP-A- 0586426 FI-D- 935108 FI-D- 935109 NO-D- 934172 NO-D- 934173 WO-A- 9220454	30/12/92 30/12/92 21/11/92 21/11/92 16/03/94 00/00/00 00/00/00 00/00/00 00/00/00 26/11/92
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