(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 462 939 A1**

(12) # EUROPEAN PATENT APPLICATION

(21) Application number : **91830210.0**

(51) Int. Cl.^{5} : **F15B 15/14**

(22) Date of filing : **20.05.91**

(30) Priority : **20.06.90 IT 700490 U**

(43) Date of publication of application :
27.12.91 Bulletin 91/52

(84) Designated Contracting States :
DE ES FR GB IT SE

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(54) **Pneumatic cylinders with flow regulator incorporated.**

(57) The present invention relates to pneumatic cylinders with a central tubular body (13,23) and two heads (11,12) assembled through stay rods (16) which either extend outside the tubular body (13,23) or in slots longitudinally formed in the same, the heads (11,12) being identical for both types of cylinder in order to realize the same by simply choosing the profile of the tubular body, the cylinders also having a flow regulator (20) and optional single-acting valves (21) at the level of the heads (11,12).

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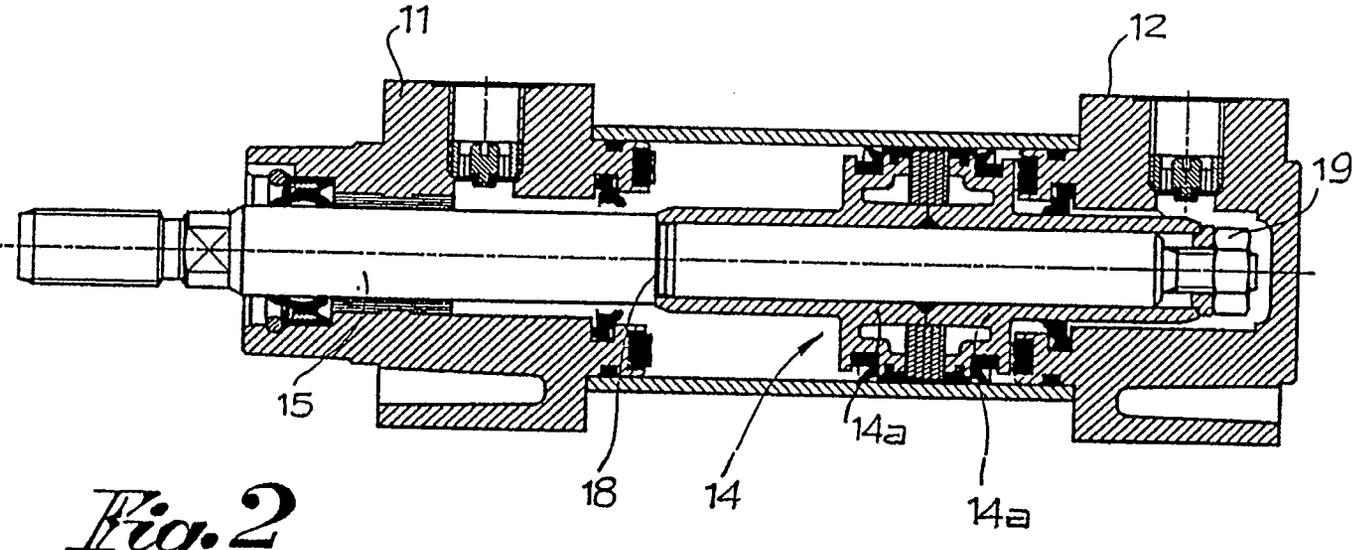


Fig. 2

The present invention relates to pneumatic cylinders with a central tubular body, in which a piston slides, and having two opposite heads assembled through stay rods which can visibly extend outside the central body or in holes longitudinally formed in the central body which will be appropriately profiled.

Said cylinders differ in certain aspects and are usually realized with specific parts, those of which designed to make up one type of cylinder cannot be used in the realization of the other type of cylinder, thus leading to equipping, constructive, storage and economical disadvantages.

The object of the present invention is to find a solution to such a problem and said disadvantages by proposing the realization of different types of pneumatic cylinders, as mentioned above, making use of identical heads for each solution and simply changing the choice of tubular body.

Another object of the present invention is to supply pneumatic cylinders incorporating a flow regulator and an optional nonreturn valve at the height of each head.

A further object of the present invention is to supply pneumatic cylinders with a piston comprising two identical elements opposed with a simple and straightforward fitting on a stem.

Examples of practical realization of the invention are shown in the attached drawings in which:

Fig. 1 is an elevated and partial section view of a cylinder with visible assembling stay rods;

Fig. 2 is a longitudinal section view of the cylinder on the arrows II-II in Fig. 1;

Fig. 3 is an end view of the cylinder on the arrow III in Fig.1;

Fig. 4 is a transversal section view of the cylinder on the arrows IV-IV in Fig. 1;

Fig. 5 is an elevated and partial section view of a cylinder with assembling stay rods passing through a profiled central tube;

Fig. 6 is a transversal section view of the cylinder on the arrows VI-VI in Fig. 5;

Fig. 7 is a section view of the valvular parts at the level of the heads;

Fig. 8 is an elevated view of a cylinder without stay rods, but with a piston and valvular parts as in the cylinders with assembling stay rods; and

Figs. 9 and 10 are two section views of the cylinder respectively on the arrows VIII-VIII and IX-IX in Fig. 7.

The cylinder as in Figs. 1 to 4 comprises two heads (11,12), a central cylinder body (13) and a piston (14) with a relative stem (15). The fixing of the heads (11,12) to the cylinder body (13) is carried out through stay rods (16) which screw into bushes (17) fitted to the heads and which longitudinally extend outside the cylinder body (13), (Figs. 1 and 4).

The cylinder shown in Figs. 5 and 6 has two identical heads (11,12) to those of the cylinder in Fig. 1 and only differs in that it has a central profiled body (23) with holes (23a) along its generatrix (Fig. 6). Thus, the heads (11,12) are fixed to the profiled body (23) through connecting stay rods (16) which extend along the holes (23a) defined by said profiled body (23).

In both realization, the piston (14) comprises two identical opposite elements (14a) with usual seals placed and blocked between a shoulder beat (18) on the stem (15) and a tightening nut (19) screwed to the internal end of the stem itself (Fig. 2).

A flow regulator (20) with adjustable positions is incorporated in each flange (11,12) of the described cylinders and an optional single-acting valve (21) can be advantageously screwed into each hole which connects to a fluid inlet/outlet canalization as illustrated in detail in Fig. 7.

Finally, a cylinder without assembling stay rods and with a central cylinder body (33) caulked to two heads (31, 32) is shown in Figs. 8 to 10. Said cylinder, however, incorporates a piston (34), flow regulators (20) and optional single-acting valves (21) as in cylinders provided with stay rods.

Claims

1) Pneumatic cylinders comprising a central tubular body (13, 23), in which a piston (14) slides, and having two opposite heads (11, 12) assembled through stay rods (16) which can visibly extend outside the central body or in holes longitudinally formed in the central body (23) which is appropriately profiled, characterized in that the heads (11, 12) are identical for both cylinders and are fitted to both a central body (13) with external connecting stay rods and to a central body (23) with stay rods which extend along holes defined by the body itself.

2) Pneumatic cylinders as claimed in claim 1, characterized in that said heads (11, 12) have threaded bushes (17) to which connecting stay rods (16) are screwed.

3) Pneumatic cylinders as claimed in claims 1 and 2, characterized in that each head (11, 12) incorporates a flow regulator (20).

4) Pneumatic cylinders as claimed in claims 1 and 2, characterized in that each head (11, 12) incorporates a flow regulator (20) and is fitted with a single-acting valve (21) which is screwed into a hole to which fluid inlet/outlet canalization are connected.

5) Pneumatic cylinders as claimed in claim 1 and any of the claims 2 to 4, characterized in that the piston (14) comprises two identical opposite elements (14a) with seals placed and blocked between a shoulder beat (18) on the stem (15) and a tightening nut (19) screwed to the end of the stem inside the cylinder.

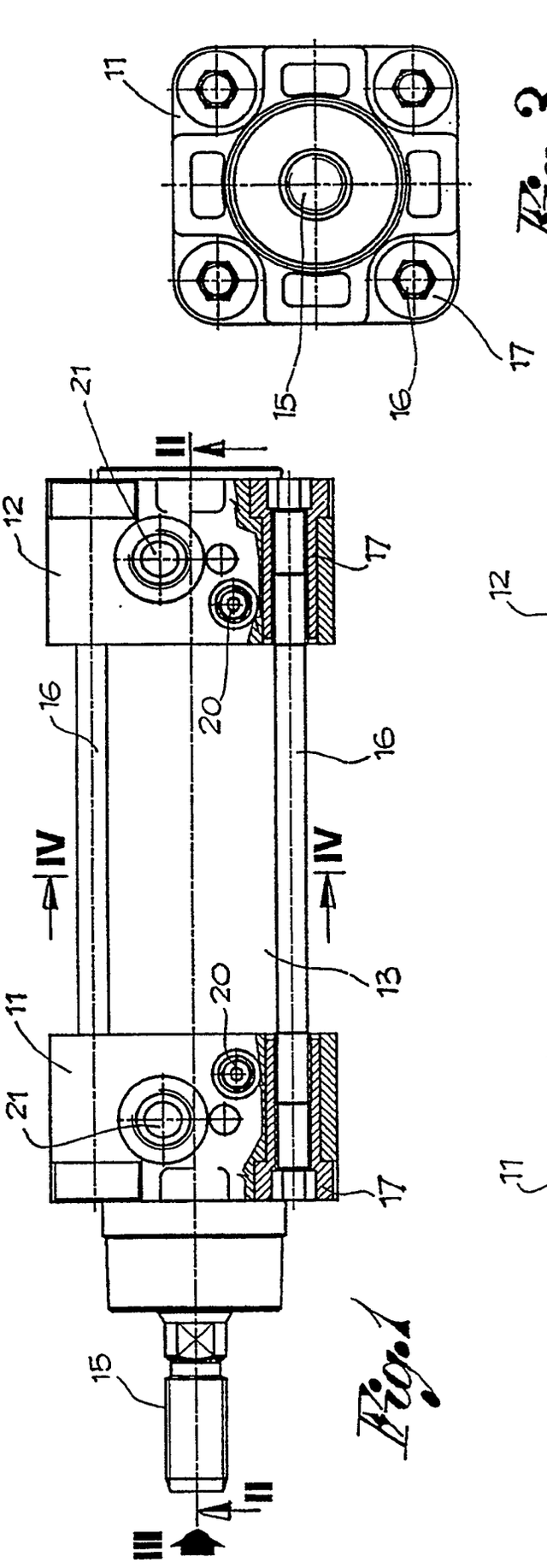


Fig. 1

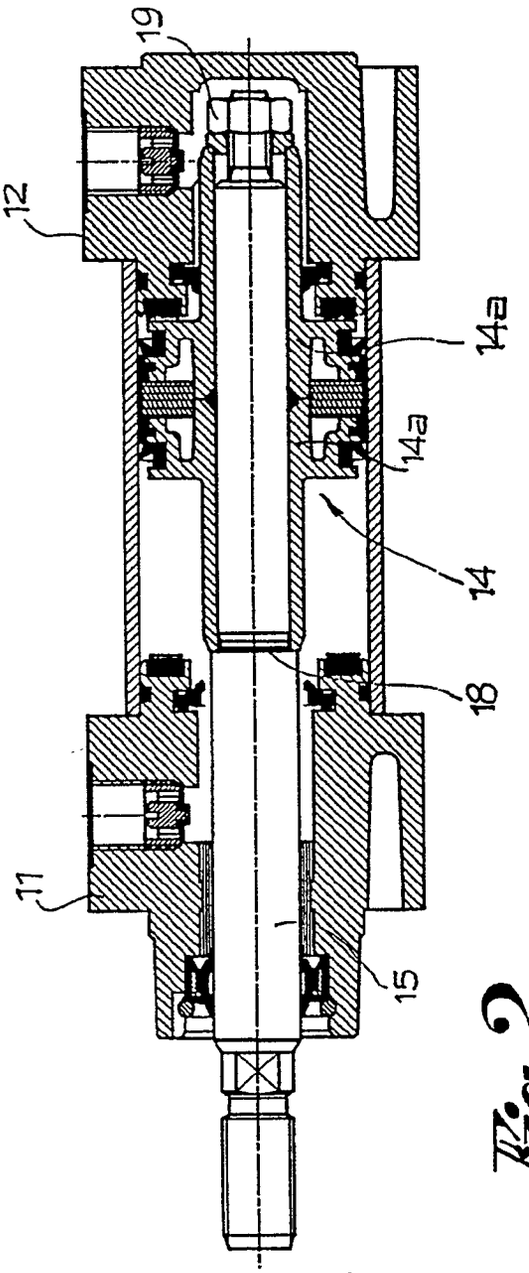


Fig. 2

Fig. 3

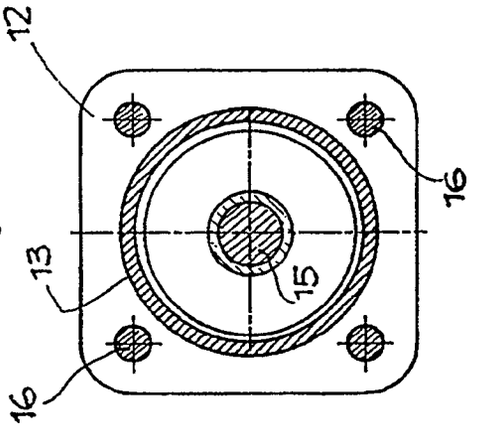


Fig. 4

Fig.5

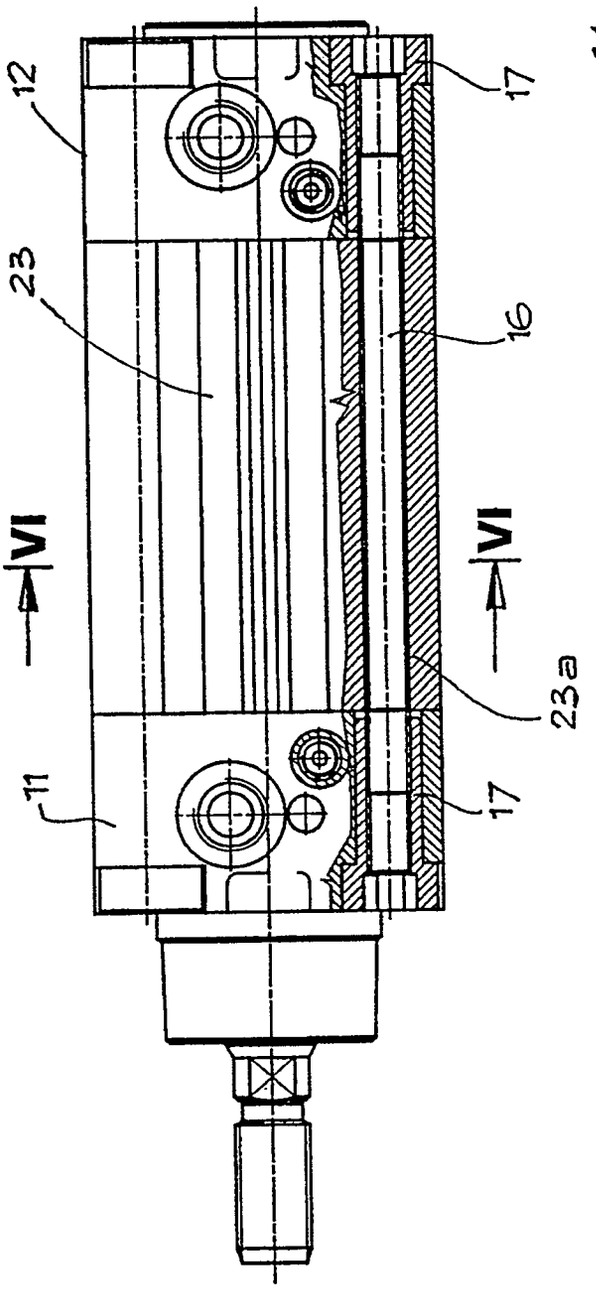


Fig.6

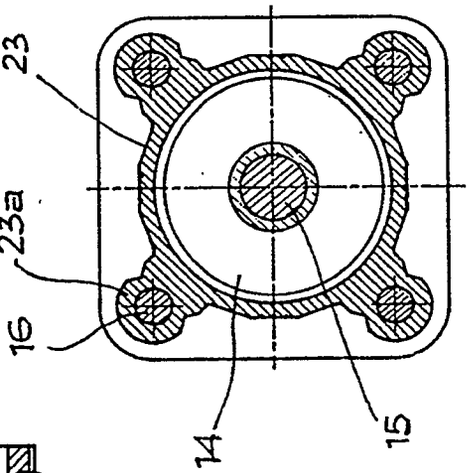
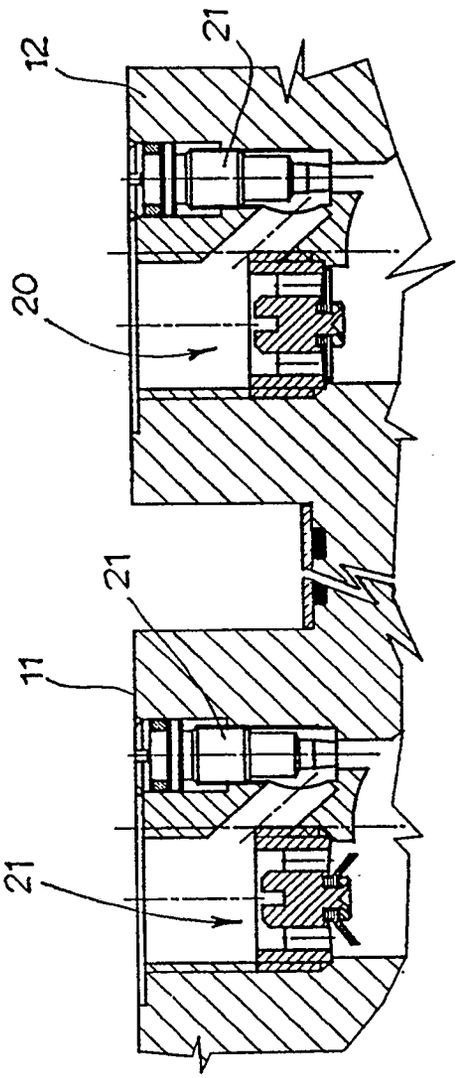


Fig.7



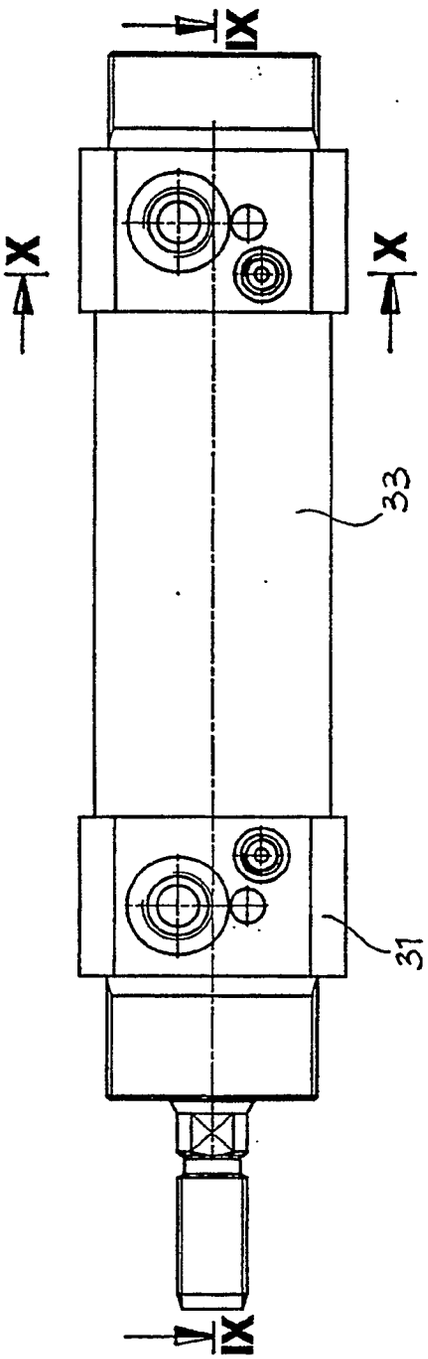


Fig.8

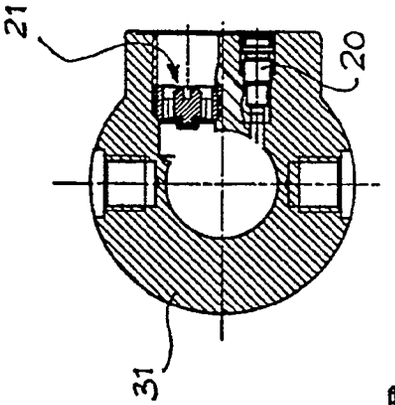


Fig.10

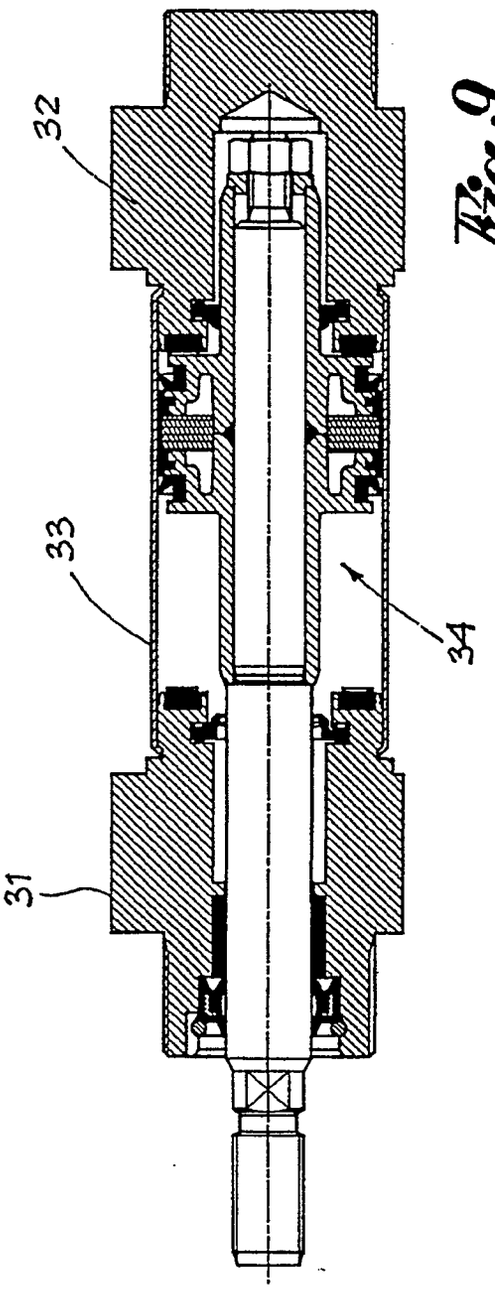


Fig.9

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EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0210

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)
Y	FR-A-2575527 (LA TELEMECANIQUE ELECTRIQUE) * page 4, line 1 - page 4, line 6 * * page 6, line 24 - page 7, line 13; figures 1, 2, 8-10 *	1, 3-5	F15B15/14
Y	GB-A-1547888 (OILES INDUSTRY) * page 3, line 22 - page 3, line 33 * * page 5, line 94 - page 5, line 111; figures 3, 4, 8 *	1, 3-5	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			F15B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	10 SEPTEMBER 1991	THOMAS C.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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