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(54) Oscillatilng support unit for chairs with seat and backrest having synchronized variable tilting

(57) An oscillating support unit for chairs with seat and backrest having synchronized variable tilting, in which the backrest support (14) is jointed, in its front portion, to the boxed body (11) on an axis of oscillation (Y) parallel to the axis of oscillation (X) of the seat support (13). In addition, the backrest support (14) is connected, without sliding, to the seat support (13) by means of an intermediate transverse shaft, in slotted holes (18) obtained in a portion of the boxed body with the possibility to translate horizontally, in parallel to itself.

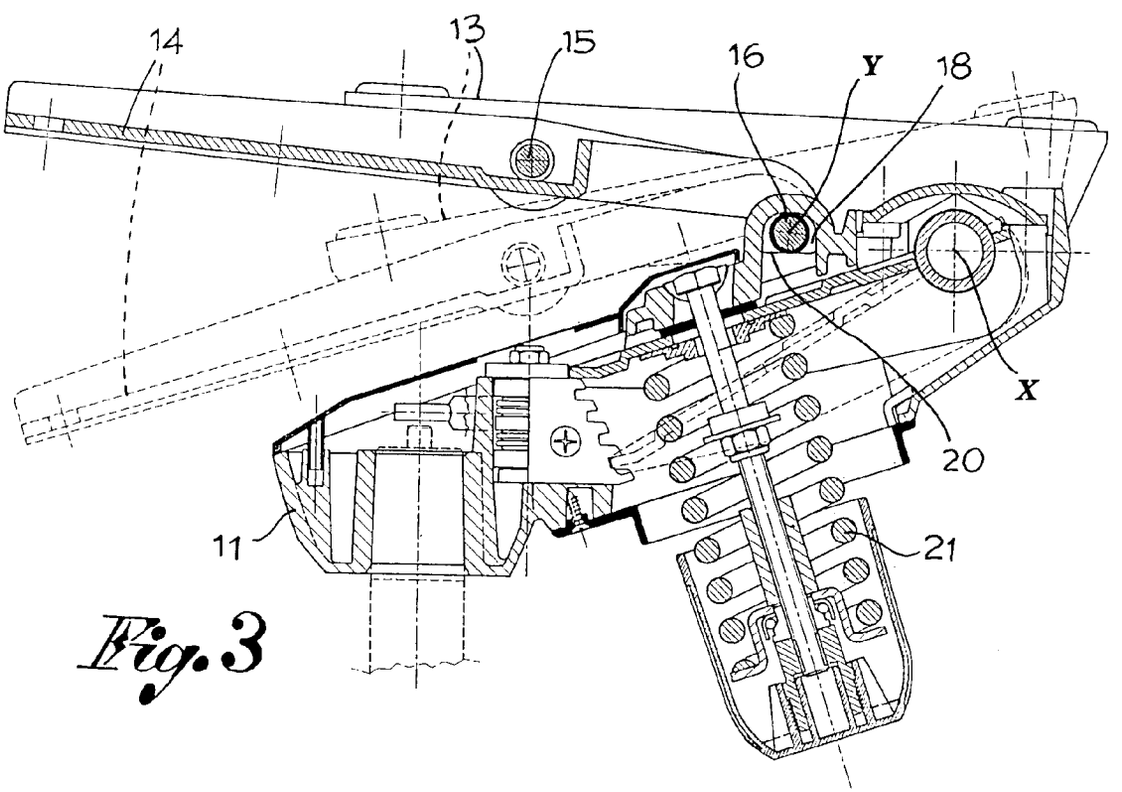

Fig. 3

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Description

The present invention pertains in general to chairs with seat and backrest having synchronized variable tilting, and more specifically an oscillating support unit for the elements of the seat of such chairs.

Various constructions of chairs and armchairs, especially for offices, are known in which seat and backrest have synchronized variable tilting, that is to say susceptible to independent angular movements on corresponding axes of horizontal rotation. In practice, the seat may tilt gradually upwards and with respect to a fixed body supported by a base while the backrest varies its tilt automatically according to the arrangement of the seat, or vice versa. The synchronization of the movements is obtained through an articulated joint with parallel axes of the seat supports and of the backrest between them and at the stationary support body and with the aid of opposing elastic elements.

In some known embodiments, the articulated joint between said supports is obtained with lever mechanisms or with synchronization connectors that make it possible to compensate reciprocal sliding of the supports oscillating on different axes.

In other embodiments, the freedom of reciprocal sliding between said supports is achieved by introducing the articulation axis connecting the supports of seat and backrest through a slot.

It is an object of the present invention to provide an oscillating support unit for the kind of chairs and armchairs described above, whose components have an original arrangement and combination and improved features of simplicity and efficiency without resorting to additional levers or connectors.

Such an object is achieved with an oscillating support unit for chairs with seat and backrest having synchronized variable tilting according to claim 1.

Further details of the invention will anyhow become apparent from the continuation of the description made with reference to the accompanying drawings in which:

Figure 1 is a plan view of the support unit;
Figure 2 is its side view;
Figure 3 is a longitudinal cross-sectional view according to line III-III in Fig. 1; and
Figure 4 shows a transversal cross-sectional view according to line IV-IV in Fig. 1.

The unit at issue essentially comprises a boxed body 11 fixed to the top of a supporting upright 12 which rises on a base -not illustrated- and usually at an adjustable height, a support 13 for the seat and a support 14 for the backrest of the seat.

The boxed body 11 is fixed and has an invariable arrangement and extends forwards overhanging the supporting upright 12. The seat support 13 is jointed, at the front, to the front of the fixed boxed body 11 on an axis X oriented transversely to the seat. Said support 13 extends backwards overhanging with the possibility of oscillating over the fixed body 11. For its part, the backrest support 14 is connected to the seat support 13, without sliding, by means of a transverse shaft 15 for their combined oscillations in response to the oscillation of one of them.

In its front portion the backrest support 14 is also jointed to the fixed boxed body 11 on an axis Y parallel to the axis of oscillation X of the seat support 13. The axis Y is formed by a shaft 16 fixed between two lugs 17 integral with the seat support 13, and this shaft 16 extends into slotted holes 18 obtained in a portion 11' integral with the fixed boxed body 11.

On the shaft 16 a sleeve 19 is mounted in a non-friction plastic material. The slotted holes 18 have dimensions in height equal to the diameter of the shaft with the non-friction sleeve 16, 19 and in length greater than this diameter, the length extending horizontally. In this way, the shaft with the non-friction sleeve 16, 19 may turn and translate horizontally in the slotted holes 18 in parallel to itself, without however being able to move in height. To help its translation movements, the shaft with the non-friction sleeve 16, 19 rests on two horizontal guiding surfaces 20 to the side of the slotted holes 18.

With such an assembly of components 11, 13 and 14 every forced oscillation of the seat support 13 on the relative X axis is automatically transmitted to the backrest support 14 thanks to the connecting shaft 1 for a correlated variation of the tilt of the two components. Then the backrest support 14, dragged by the seat support 13, oscillates on the Y axis. Given the parallel arrangement of the two axes of oscillation X and Y and the different distance of the connecting shaft from these axes, the shaft 16 of the backrest support is forced to translate horizontally as it is thus possible due to the slotted holes. The same clearly occurs with the application of a force on the backrest in the sense of moving it angularly.

To minimize the horizontal translation of the shaft 16 as a consequence of the synchronized oscillations of the seat and backrest, the shaft 16 forming the axis of oscillation Y of the backrest support is placed on the bisector of the maximum angle of aperture between the fixed body and the seat support and having the axis of oscillation X of the latter as vertex.

In any case, the synchronized movements of the supports 13, 14 are opposed, by elastic means as is usual, that is springs 21 tending to recover the initial position of the components once the action that caused the change in tilt has ceased.

Claims

1. An oscillating support unit for chairs with seat and backrest having synchronized variable tilting, comprising a boxed body (11) applied on the top of a

support upright (12), a seat support (13) and a backrest support (14) and in which the boxed body (11) is fixed and has an invariable arrangement and the seat support (13) is jointed, in its front portion, to the front portion of said boxed body (11) on an axis of oscillation (X) oriented transversely to the seat, **characterized in that** the backrest support (14) is jointed, in its front portion, to the boxed body (11) on an axis of oscillation (Y) parallel to the axis of oscillation (X) of the seat support (13), in that said backrest support (14) is connected without sliding to the seat support (13) by means of an intermediate transversal shaft, and in that said axis of oscillation (Y) of the backrest support (14) is formed by a shaft (16) which extends in slotted holes (18) obtained in a portion of the boxed body with the possibility of translating horizontally, parallel to itself, as a consequence of the synchronized oscillations of said supports.

2. An oscillating unit according to claim 1, wherein said shaft (16) forming the axis of oscillation (Y) of the backrest support (14) is fixed between two lugs (17) integral with said support (14), and is enclosed in a sleeve (19) of non-friction material.

3. An oscillating unit according to claims 1 and 2, wherein said shaft (16) with non-friction sleeve (19) rests on horizontal sliding surfaces (20) to the side of the slotted holes.

4. An oscillating unit according to the above claims, wherein the axis of oscillation (Y) of the backrest support (14) is placed, preferably, on the bisector of an angle of maximum aperture between the boxed body and the seat support and having the axis of oscillation (X) of said seat support as vertex.

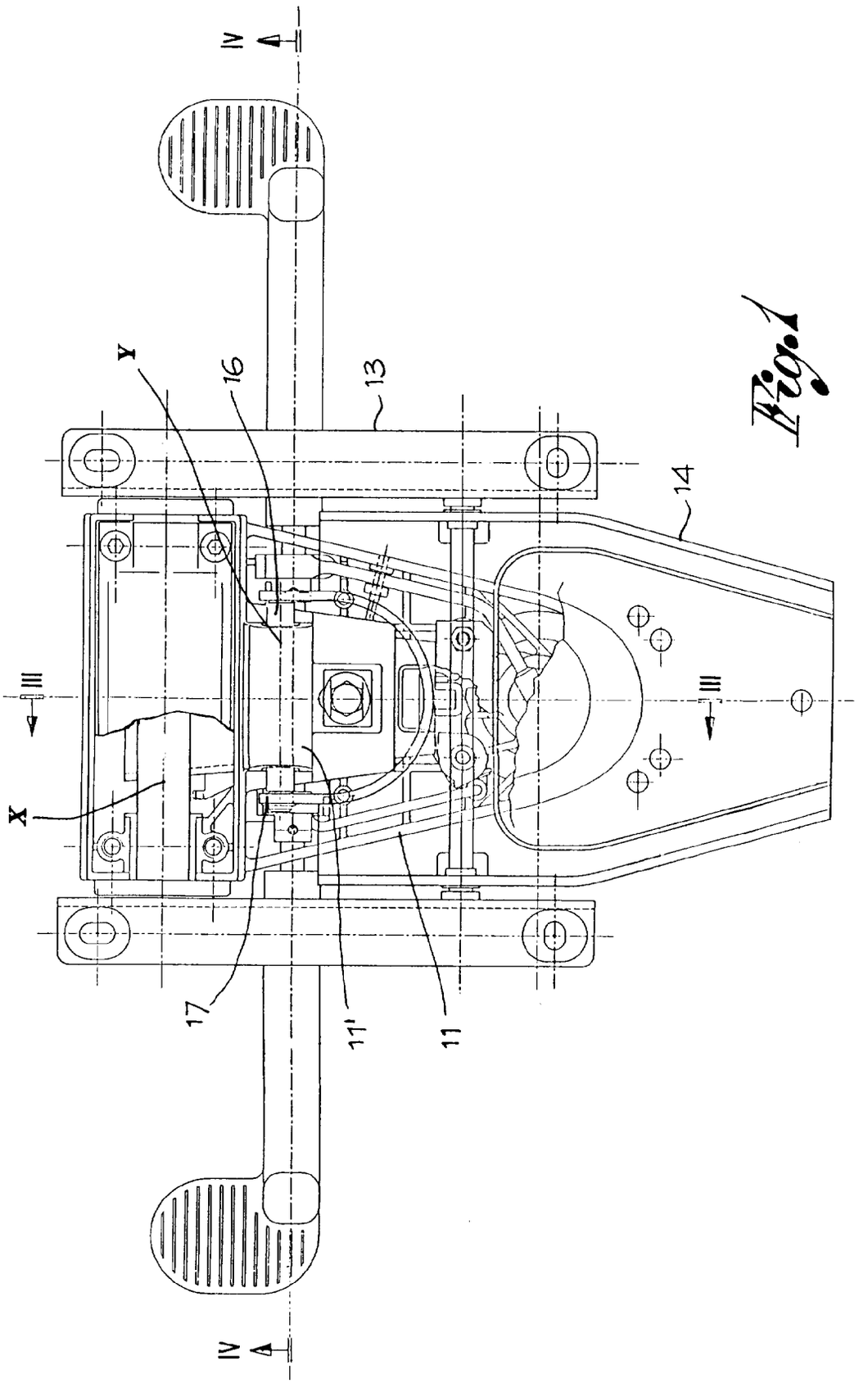

Fig.1

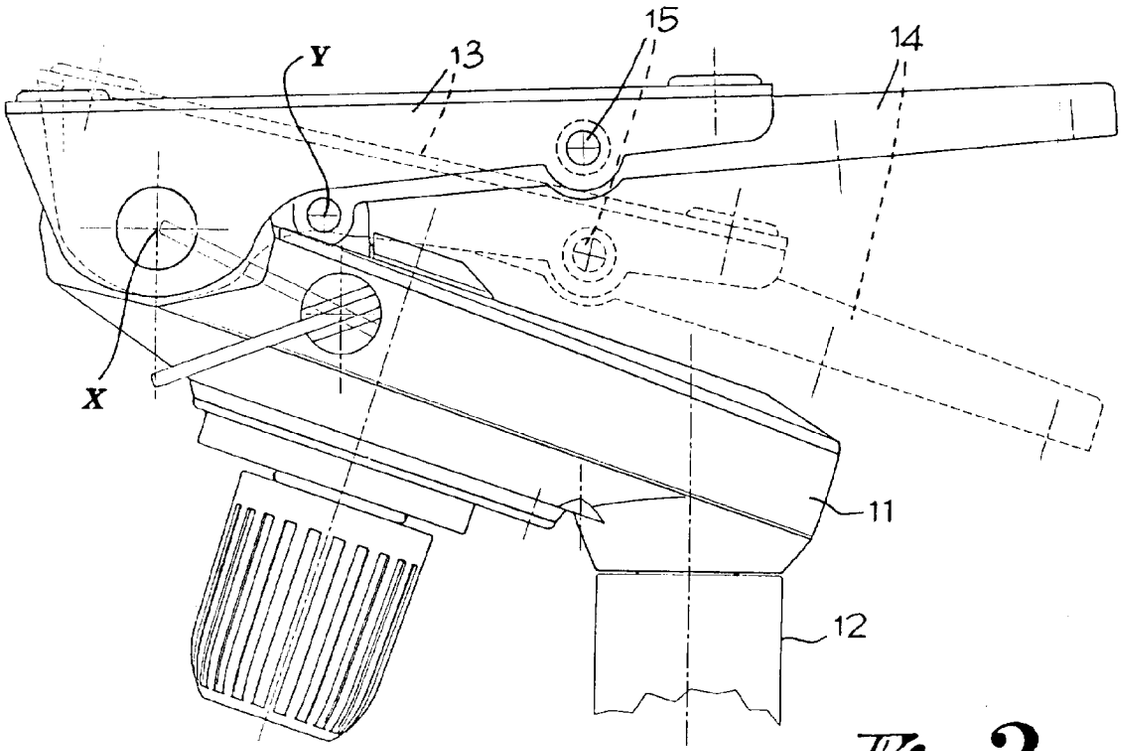

Fig. 2

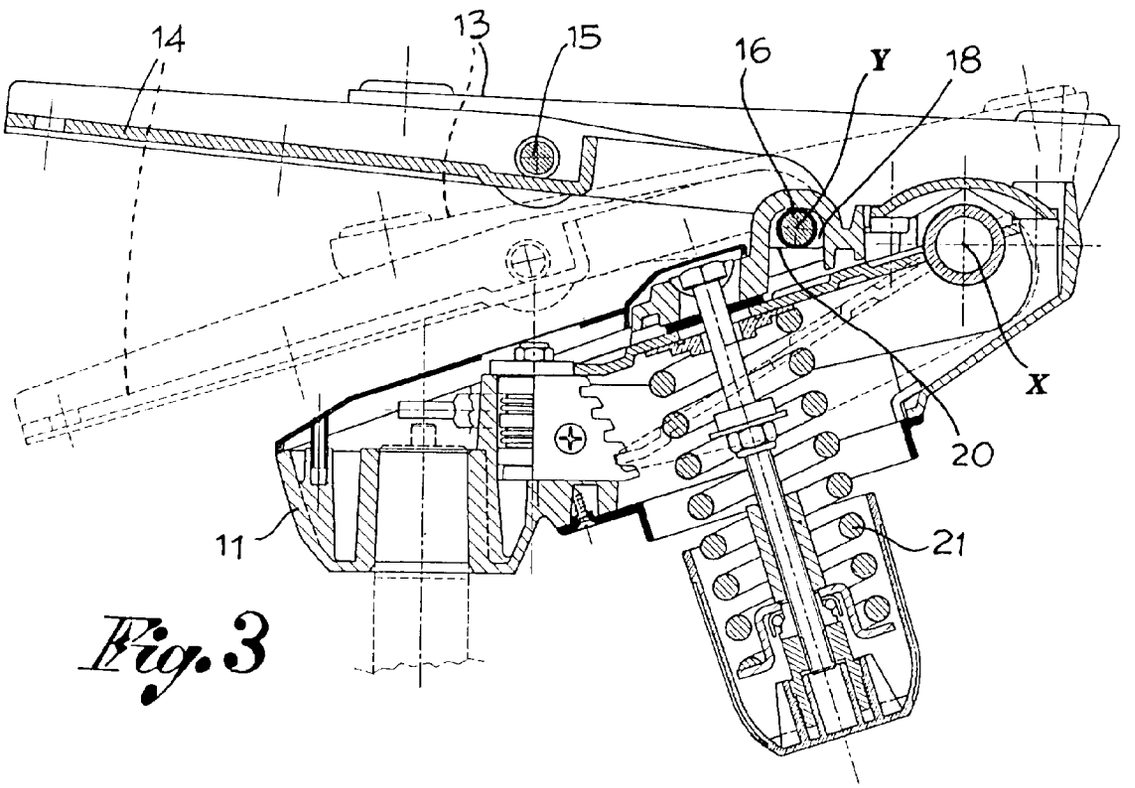

Fig. 3

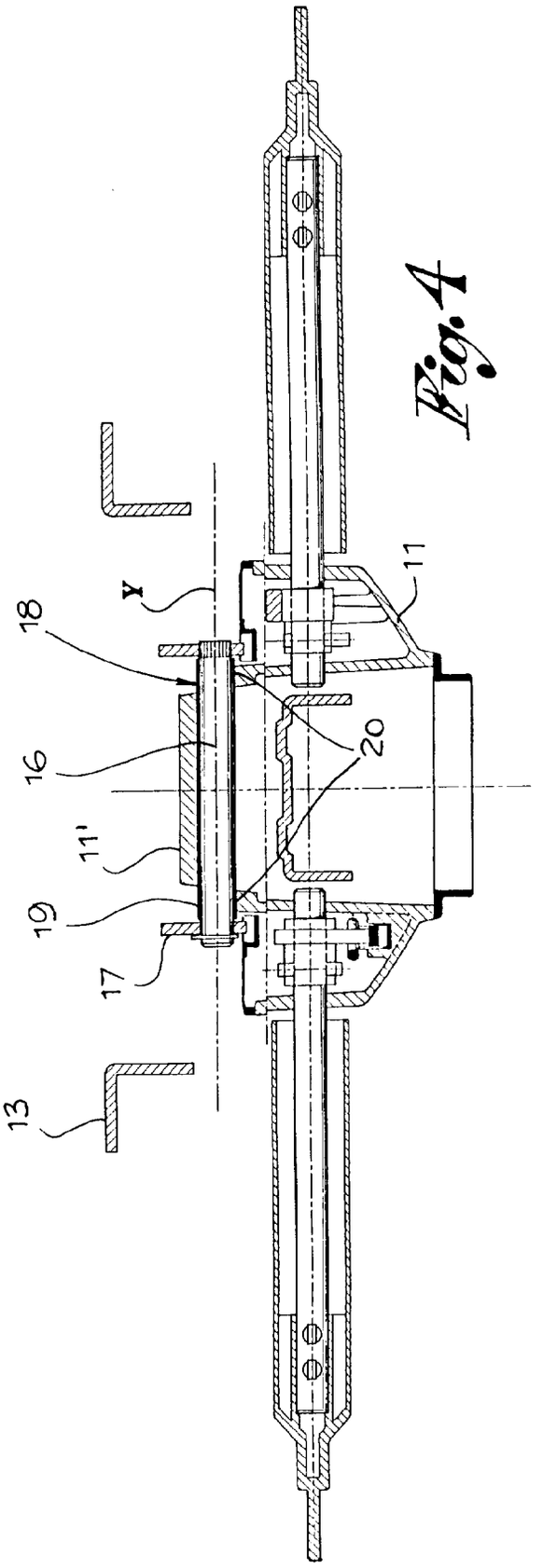

Fig. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 83 0265

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)
X Y	US-A-4 830 431 (INOUE) * column 3, line 4 - column 5, line 39; figures 1-3 *	1 2,3	A47C1/032 A47C3/026
Y	US-A-4 013 257 (PAQUETTE) * column 3, line 6 - line 42; figures 3,7,11 *	2,3	
A	DE-A-43 03 351 (FROLI KUNSTSTOFFE HEINRICH FROMME) * column 3, line 13 - line 29 * * column 9, line 49 - column 10, line 1; figures 1,3,35,36 *	1	
P,X	EP-A-0 636 329 (MEIKO INDUSTRY) * column 2, line 38 - column 4, line 40; figures 1-7 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A47C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 January 1996	Mysliwetz, W

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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