



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.08.2004 Bulletin 2004/35

(51) Int Cl.7: **D06B 23/20**, D06B 23/22,
B01F 13/10

(21) Application number: **04425073.6**

(22) Date of filing: **06.02.2004**

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

(30) Priority: **18.02.2003 IT FI20030015 U**

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(54) **Apparatus for carrying out dyeing operations on textile materials**

(57) Apparatus for preparing colouring substances intended for, in particular, the textile industry, characterized in that it comprises in combination means (2) for

the controlled withdrawal and delivery of products for the preparation of colouring substances, and a stirring device or shaker (3) able to receive one or more containers (30) for holding said products.

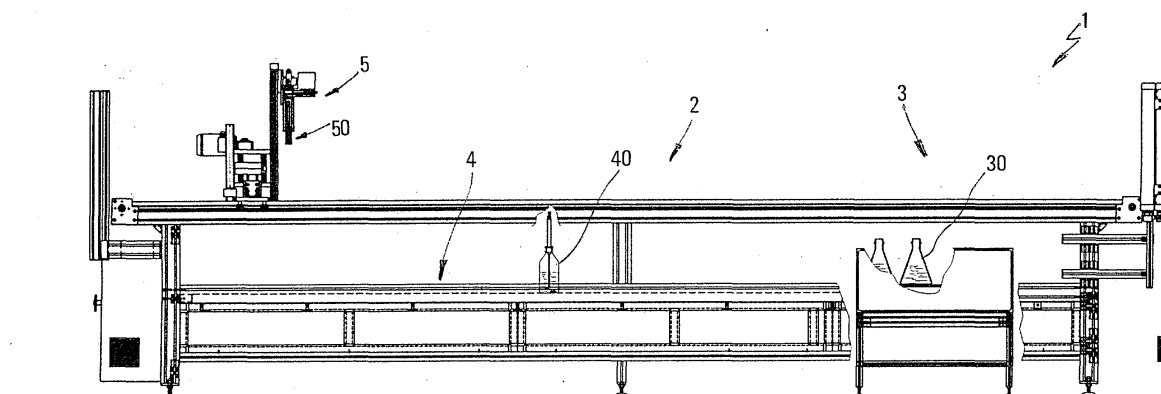


Fig. 1

Description

[0001] The present invention refers to an apparatus for carrying out dyeing operations on textile materials.

[0002] The technique of preparing colouring substances with the use of stirring devices or shakers is known. These devices receive a preset number of containers for holding suitable quantities of chemical products and solvents for the formation of so-called dyeing baths, and are provided with suitable means able to stir said containers and heat them up so that the dyeing bath will operate in consequence of the stirring and heating of products and solvents introduced into the containers together with the materials to be dyed.

[0003] Currently, the operations of said technique, in particular the steps for metering the products, are carried out by hand and, for this reason, errors are likely to occur, and the results obtained may be affected by fortuity and hardly repeatable, while the work safety for the operators is of a reduced degree.

[0004] The main object of the present invention is to eliminate, or at least greatly reduce, the above drawbacks.

[0005] This result has been achieved, according to the invention, by adopting the idea of making a machine having the characteristics disclosed in claim 1. Further characteristics being set forth in the dependent claims.

[0006] The present invention makes it possible to significantly raise the automation level of the dyeing cycle, thus releasing the operators from doing the most difficult operations, such as the metering and the filling of shaker's containers, thereby reducing the risk related to possible handling errors, and increasing the reliability and uniformity of the dyeing cycles, while increasing the safety of work for the operators at the same time.

[0007] These and other advantages and characteristics of the invention will be best understood by anyone skilled in the art from a reading of the following description in conjunction with the attached drawings given as a practical exemplification of the invention, but not to be considered in a limitative sense, wherein:

- Figs. 1 and 2 show schematically a possible embodiment of the present invention in side view (Fig. 1) and top view (Fig. 2), with some parts being taken away;
- Fig. 3 is a schematic side view, with parts taken away, of a detail from Fig. 1 relating to a stirring device or shaker; and
- Fig. 4 illustrates four steps designated, respectively, (a), (b), (c), (d) and (e), of a possible example of withdrawal and delivery of fluids by using the present invention, with the present apparatus shown in partial side view.

[0008] With reference to the figures of the attached drawings, an apparatus 1 according to the invention can be used for preparing colouring substances intended, in

particular, for the textile industry.

[0009] The apparatus 1 comprises means 2 for the controlled withdrawal and delivery of preset quantities of products for the preparation of colouring substances, and a stirring device or shaker 3 for vibrating and heating one or more containers 30 intended for receiving the said products and the materials to be dyed.

[0010] The means 2 for the controlled removal and delivery comprise a support plane 4 upon which a plurality of containers (also called bottles) are disposed for holding products for the preparation of colouring substances. In the attached figures, one bottle 40 only has been shown upon the plane 4, for the sake of clarity; it is understood, however, that the bottles will be in greater number, and possibly disposed throughout the surface of the plane 4, when holding different chemical products, water, etc.

[0011] Disposed and acting on the plane 4 is an operating head 5 which supports a withdrawal member 50 which is movable longitudinally, transversally and vertically with respect to the plane 4, and is automatically operated by through suitable software. The withdrawal member 50 may be of volumetric type and consisting of a single or multiple pipette.

The characteristics of said means 2 for the controlled withdrawal and delivery will not be described in greater detail as they are well known to those skilled in the art.

[0012] Actually, dyeing machines are known comprising a platform upon which there are positioned, in a preset order, a plurality of vessels or bottles able to hold preset amounts of products which contribute to the formation, when properly metered, of dyeing baths within suitable containers or cups. In this connection, the patent US-6105636 describes a machine comprising a horizontal platform on which there are positioned vessels containing the basic products, as well as means associated with a movable carriage above said platform, in order to remove, according to a program, the products from said vessels and metering them within other containers inside which the solutions are formed for the dyeing tanks.

[0013] The withdrawal member 50 can be disposed, automatically, in correspondence of the bottles 40 to perform the withdrawal of the products held therein, and it can be displaced as far as to result in correspondence of one or more containers or bottles 30 of the shaker 3, in order to pour therein the products previously removed in properly preset amounts.

[0014] Shown in Fig. 4 are some operating steps that the present apparatus is able to perform in a fully automatic manner. In the step (a) (see Fig. 4), the operating head 5, with the hold member 50, has already taken out one or more products from the bottles 40 disposed onto the plane 4. Thereafter, in the step (b), as illustrated, the head 5 moves up above the shaker 3 in correspondence of one of cups 30 in order to pour therein, during the step (c), the products previously taken out from the bottles 40. Thereafter, during the step (d), the head is lifted

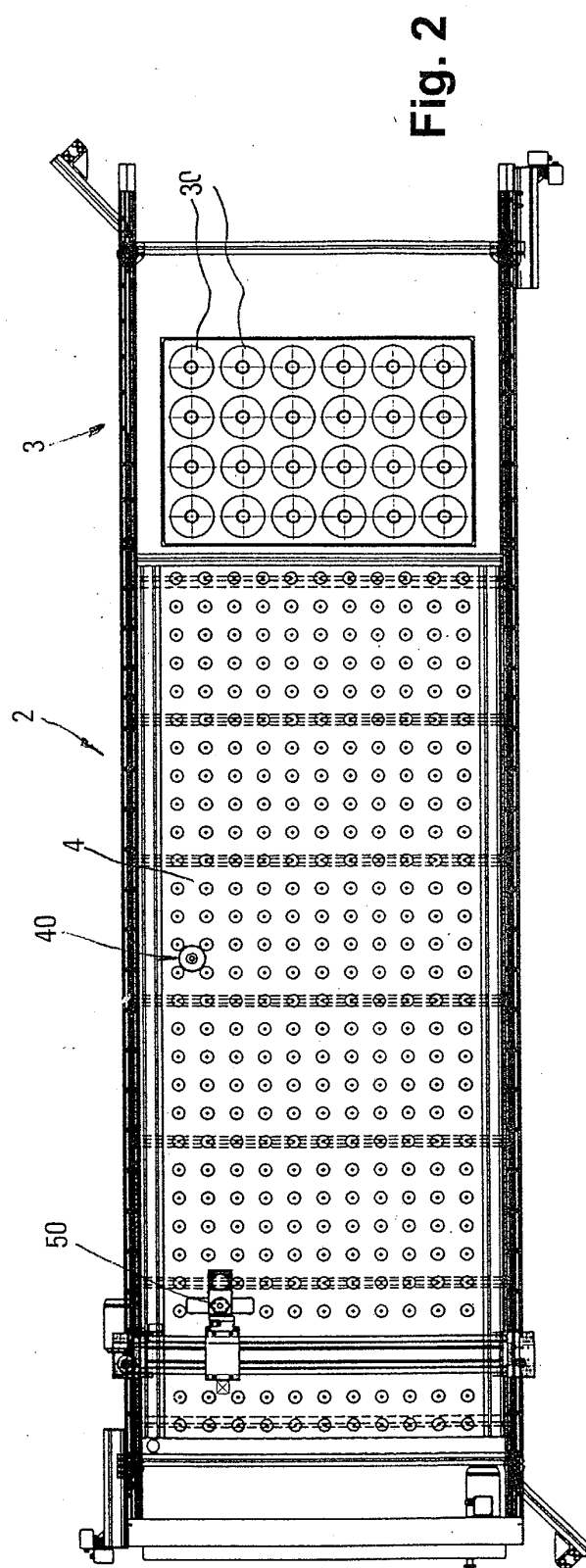
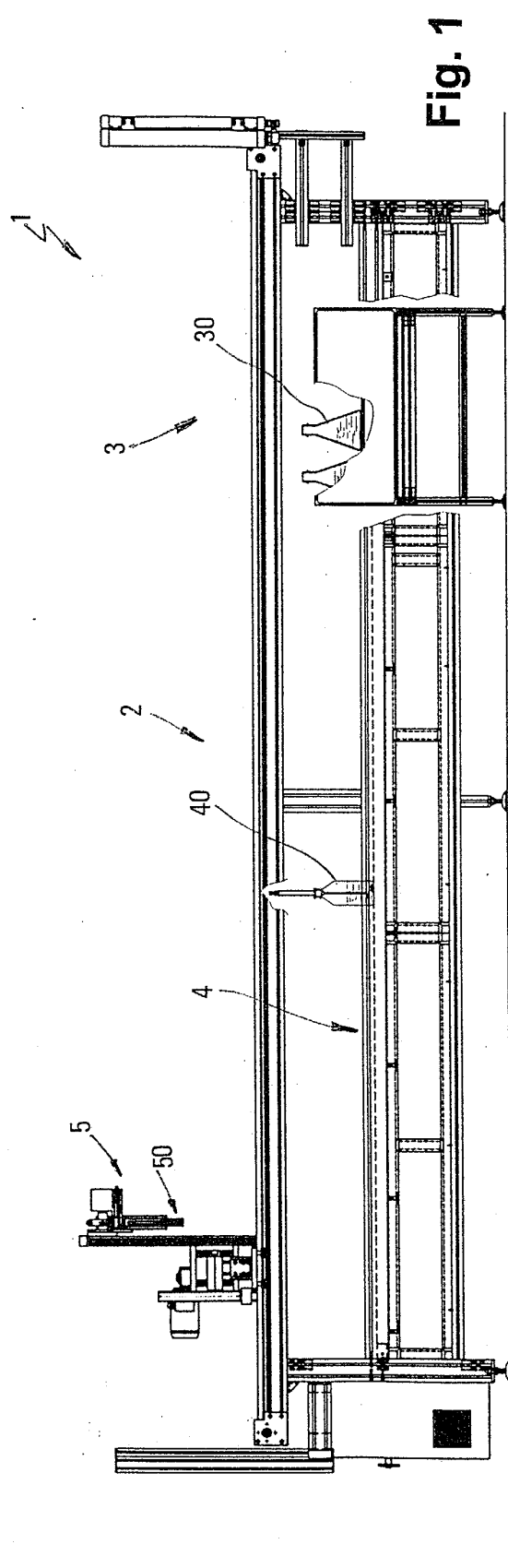
to move back, in the step (e) as shown, onto the plane 4 for a further operation.

[0015] Best visible in Fig. 3 is the stirring device or shaker 3. The shaker 3 has a containment structure (38) which is supported by a base structure 39 holding the cups 30. The arrows V indicate schematically the movement of the structure 38 which allows putting the cups under vibration with the relevant content.

[0016] Likewise, the arrows H indicate the cups' heating action which, together with the said vibration, optimizes the dyeing process of the materials held therein.

Claims

1. Apparatus for preparing colouring substances intended for, in particular, the textile industry, **characterized in that** it comprises, in combination, means (2) for the controlled withdrawal and delivery of products for the preparation of colouring substances, and a stirring device or shaker (3) able to receive one or more containers (30) for holding said products.
2. Apparatus according to claim 1, **characterized in that** the said stirring device or shaker (3) is provided with heating means.
3. Apparatus according to claim 1, **characterized in that** the said means (2) for the controlled withdrawal and delivery comprise a support plane (4) onto which a plurality of containers or bottles (40) are disposed for containing products for the preparation of colouring substances, and an operating head (5) disposed and acting on said plane (4), said head being automatically movable longitudinally, transversally and vertically with respect to the plane 4, according to a program, and supporting a withdrawal member (50).
4. Apparatus according to claim 3, **characterized in that** the said withdrawal member (50) is of volumetric type and consisting of a single or multiple pipette.



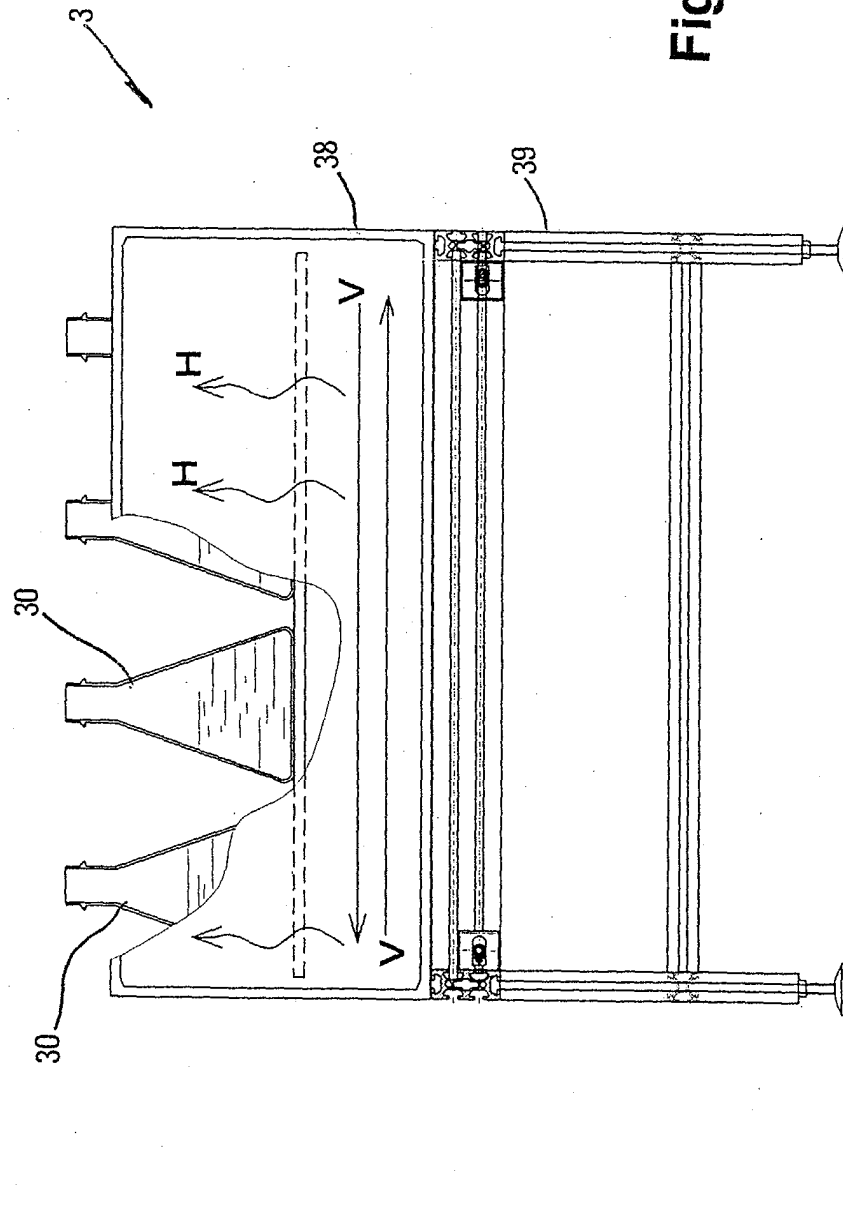


Fig. 3

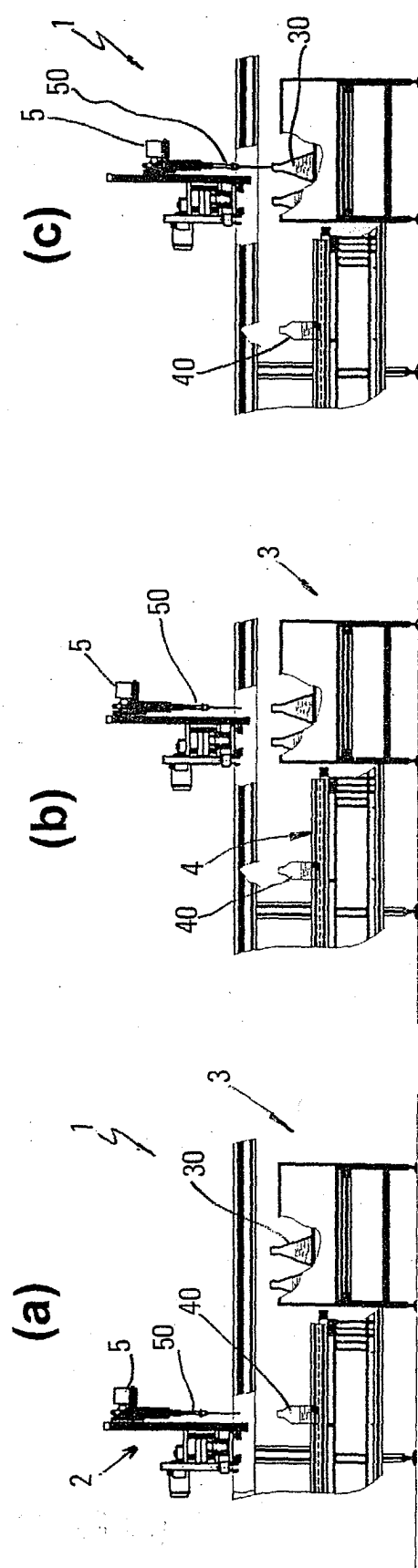
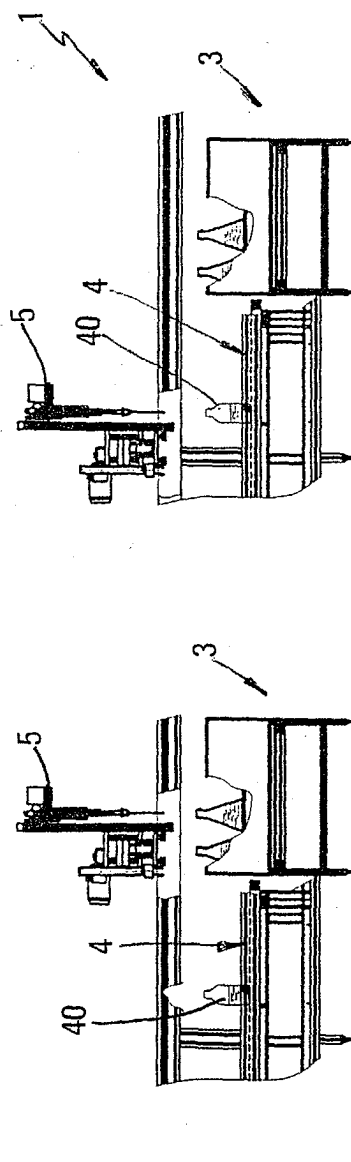


Fig. 4



(d)

(e)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5073

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.7)
X	EP 0 612 558 A (ICI PLC) 31 August 1994 (1994-08-31) * column 12, line 7 - column 13, line 30; figures 1-4 *	1	D06B23/20 D06B23/22 B01F13/10
X	EP 0 478 211 A (FLUID MANAGEMENT LP) 1 April 1992 (1992-04-01) * column 4, line 7 - line 32 * * column 5, line 42 - column 6, line 23; figures 1,4,8 *	1	
A	EP 1 174 535 A (TECNORAMA SRL) 23 January 2002 (2002-01-23) * column 5, line 45 - column 6, line 21; claim 1; figures 1B,10-12 *	1,3,4	
A	US 6 105 636 A (BARTALUCCI MORENO ET AL) 22 August 2000 (2000-08-22) * the whole document *	1,3,4	
A	DE 513 285 C (IG FARBENINDUSTRIE AG) 25 November 1930 (1930-11-25) * the whole document *	1,2	TECHNICAL FIELDS SEARCHED (Int.Cl.7) D06B B01F
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 25 May 2004	Examiner Bichi, M
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 O : non-written disclosure P : intermediate document 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 & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 42 5073

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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25-05-2004

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 0612558	A	31-08-1994	AT	119067 T	15-03-1995
			AU	665329 B2	21-12-1995
			AU	5385094 A	18-08-1994
			DE	69300071 D1	06-04-1995
			EP	0612558 A1	31-08-1994
			US	5493840 A	27-02-1996
			ZA	9304441 A	10-08-1994

EP 0478211	A	01-04-1992	US	5137367 A	11-08-1992
			AU	636245 B2	22-04-1993
			AU	8467291 A	02-04-1992
			BR	9104172 A	02-06-1992
			CA	2051950 A1	29-03-1992
			EP	0478211 A1	01-04-1992
			FI	914561 A	29-03-1992
			JP	4265139 A	21-09-1992
			JP	7121352 B	25-12-1995
			MX	173899 B	07-04-1994

EP 1174535	A	23-01-2002	IT	FI20000153 A1	07-01-2002
			EP	1174535 A2	23-01-2002
			US	2002004020 A1	10-01-2002

US 6105636	A	22-08-2000	IT	FI980070 A1	27-09-1999
			EP	0945728 A2	29-09-1999

DE 513285	C	25-11-1930	NONE		
