



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.07.2005 Bulletin 2005/28

(51) Int Cl.7: **D01G 19/10**

(21) Application number: **05000383.9**

(22) Date of filing: **11.01.2005**

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

(72) Inventor: **Ceriani, Aldo**
20034 Giussano (Prov. of Milano) (IT)

(74) Representative: **Modiano, Guido, Dr.-Ing. et al**
Modiano & Associati,
Via Meravigli, 16
20123 Milano (IT)

(30) Priority: **12.01.2004 IT MI20040020**

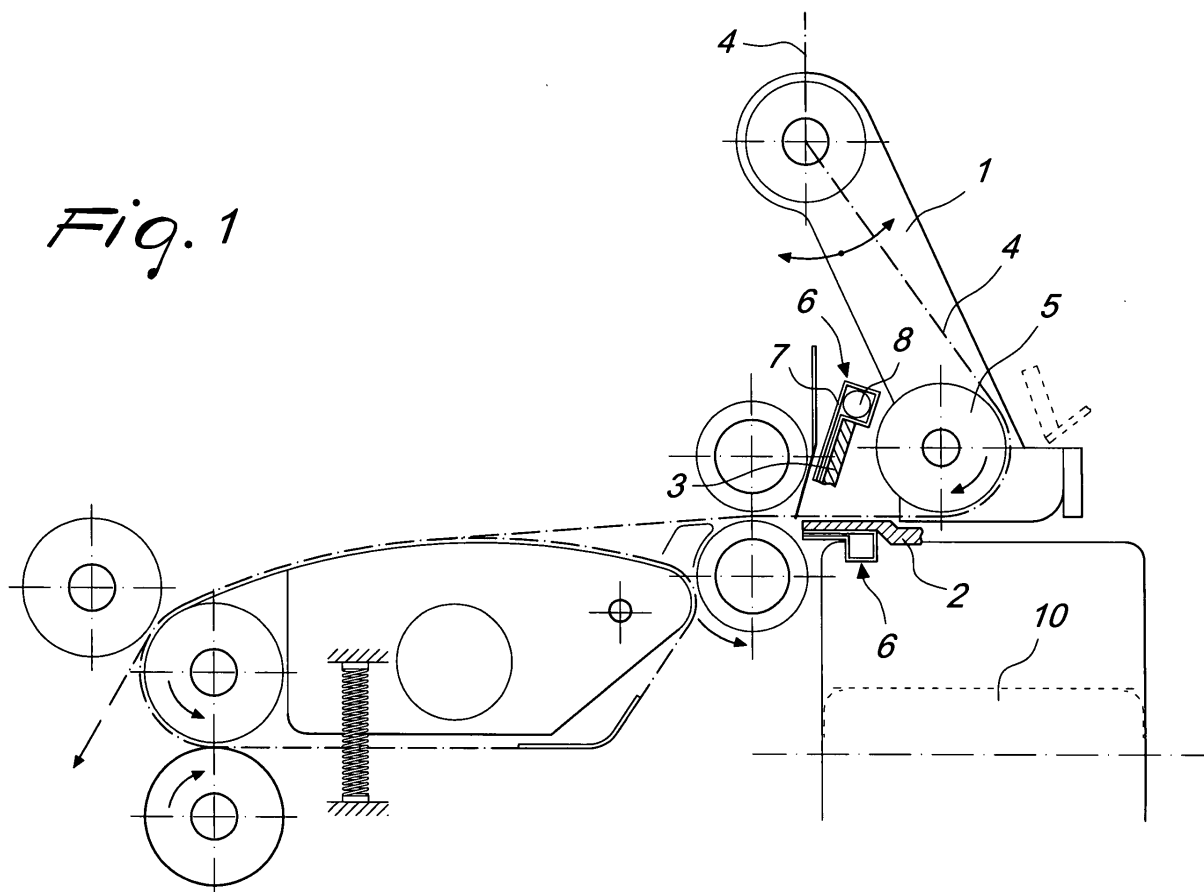
(71) Applicant: **Ceriani, Aldo**
20034 Giussano (Prov. of Milano) (IT)

(54) **Combing machine with improved comb, particularly for cotton and other fibers**

(57) A combing machine for cotton and other fibers, comprising an oscillating lever (1) that supports a first jaw (2) and a second jaw (3), at least one roller (5) for

feeding the cotton tufts to be combed, and at least one comb (6) for combing the cotton tufts, the at least one comb being a pneumatic comb (6) fitted onto at least one of the first and second jaws (2, 3).

Fig. 1



Description

[0001] The present invention relates to a combing machine with improved comb, particularly for cotton and other fibers. More particularly, the invention relates to a combing machine with a comb that is capable of treating the cotton tufts in an optimum manner without damaging them.

[0002] As is known, cotton tufts need to be combed in order to provide a cotton sliver formed by cotton fibers having a specific length.

[0003] For this purpose, the cotton tufts are combed so as to eliminate from the tufts the fibers that do not reach the intended length, and the combed cotton is then formed into a sliver by means of suitable mechanisms with differentials or by means of various lever mechanisms.

[0004] The cotton is currently combed by means of a circular comb, which is arranged below a lower jaw that is adapted to mate with an upper jaw and between which the material to be combed passes.

[0005] The use of a circular comb, however, suffers drawbacks which are due first of all to the fact that the comb can stress and break fibers of the cotton tufts. Moreover, the circular comb that is currently used is unable to eliminate the dust that is present in the combed material, and this is a drawback for the quality of the resulting cotton.

[0006] Moreover, the circular comb according to the known art is unable to eliminate with extreme precision fibers that are shorter than the preset intended length. In practice, the operator sets the intended fiber length, with the intention therefore of rejecting all the fibers below such length: the circular comb is unable to eliminate precisely all the cotton fibers that are shorter than the intended length.

[0007] Moreover, if different types of cotton are to be processed, it becomes necessary to change the circular comb with another more suitable one. This operation is extremely complicated in conventional combing machines, due to the shape of the comb.

[0008] The aim of the present invention is to provide a combing machine in which the conventional circular comb can be replaced with a comb of a different type, which is capable of treating the material to be processed in an optimum manner without causing stress and breakage thereof.

[0009] Within this aim, an object of the present invention is to provide a combing machine in which the comb is capable of eliminating with precision fibers that are shorter than the preset length.

[0010] Another object of the present invention is to provide a combing machine with a comb that can be replaced easily if the process changes.

[0011] Another object of the present invention is to provide a combing machine with a comb that allows to considerably increase the degree of dust removal from the combed material.

[0012] Another object of the present invention is to provide a combing machine with an improved comb that is highly reliable, relatively simple to provide, and at competitive costs.

[0013] This aim and these and other objects that will become better apparent hereinafter are achieved by a combing machine for cotton and other fibers, comprising an oscillating lever that supports a first jaw and a second jaw, at least one roller for feeding the cotton tufts to be combed, and at least one comb for combing said cotton tufts, characterized in that said at least one comb is a pneumatic comb fitted onto at least one of said first and second jaws.

[0014] Further characteristics and advantages of the invention will become better apparent from the description of preferred but not exclusive embodiments of the combing machine according to the present invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic side elevation view of the combing machine according to the present invention; and

Figure 2 is a detail view of the comb used in the combing machine according to the present invention.

[0015] With reference to the figures, the combing machine according to the present invention comprises, as regards the section related to the combing of the cotton tufts, a lever 1, which is adapted to oscillate and support a pair of jaws 2 and 3, respectively a lower jaw and an upper jaw, through which the cotton tufts 4 to be combed pass.

[0016] The cotton 4 to be combed is fed around a feeder roller 5, which arranges the cotton tufts 4 in the space between the two jaws 2 and 3. At least one comb is provided at the upper jaw 3 or at the lower jaw 2.

[0017] Conveniently, it is also possible to provide two combs arranged at both the lower jaw 2 and the upper jaw 3.

[0018] In detail, the comb, designated by the reference numeral 6, is a pneumatic comb and is mounted so as to direct air jets onto the cotton tufts 4 that pass below it, in order to eliminate from the cotton tufts the fibers that are shorter than a certain preset length, so as to accordingly cause the combed cotton to advance to a subsequent station, where a cotton sliver is formed.

[0019] The presence of a pneumatic comb 6 instead of a mechanical comb as provided in the background art allows to avoid applying undue stress to the cotton fibers that are present in the tufts, thus eliminating the possibility of breakage of such fibers.

[0020] Moreover, the presence of the pneumatic comb allows to considerably increase the degree of dust removal from the combed material, thanks to the emission of air jets that strike the cotton tufts 4.

[0021] Another advantage provided by the presence

of a pneumatic comb is that it is possible to replace said comb rapidly, without having to disassemble the mechanical comb provided in known types of combing machines.

[0022] Conveniently, as shown in Figure 2, the pneumatic comb 6 is constituted by a body 7 that is provided with at least one, and preferably two, mutually opposite openings 8, in which compressed air passes; the body 7 is provided, in a downward region, with a plurality of notches 9, which constitute a corresponding number of outlets for the compressed air, so as to provide small separate jets.

[0023] This configuration provides a perfect and intense penetration of the air jet through the mass of fibers, removing the fraction of fibers that are shorter than the preset length.

[0024] The density, i.e., the number of notches 9, is a function of the material being processed.

[0025] Moreover, if the comb is fitted on the upper jaw 3, it is conveniently inclined with respect to the vertical, i.e., with respect to the normal to the advancement direction of the combed material. This inclination can be for example approximately 20°.

[0026] Substantially, the combing process performed with the combing machine according to the invention is as follows.

[0027] The material to be combed 4 that arrives from laps and/or drawframe belts is supplied to the pair of retention jaws 2 and 3 by means of the feeder roller 5.

[0028] The fraction of fibers of preset length that are left free by the jaws during the upward oscillation of the lever 1 are struck by one or more jets of compressed air that arrive from the comb 6, so as to remove the short fibers, which fall onto an underlying belt 10 to be discharged outside the combing machine. This first step of fiber removal is termed tuft head combing.

[0029] At this point, the combed material is sent to a section that is capable of forming the combed cotton in the form of a sliver.

[0030] Accordingly, the or each comb 6 is provided with at least one notch 9, which is capable of emitting a jet of compressed air, but preferably with a plurality of notches 9 so as to divide the air jet into a plurality of separate and closely spaced jets.

[0031] This is followed by a step for forming the sliver, to which the present invention does not relate.

[0032] In practice it has been observed that the combing machine according to the present invention fully achieves the intended aim and objects, since it allows to replace the conventional circular comb with a straight pneumatic comb that achieves a number of advantages in the combing of the cotton tufts and in the operation for replacing said comb.

[0033] The combing machine thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0034] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

[0035] The disclosures in Italian Patent Application no. MI2004A000020, from which this application claims priority, are incorporated herein by reference.

[0036] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A combing machine for cotton and other fibers, comprising an oscillating lever (1) that supports a first jaw (2) and a second jaw (3), at least one roller (5) for feeding the cotton tufts (4) to be combed, and at least one comb (6) for combing said cotton tufts, **characterized in that** said at least one comb (6) is a pneumatic comb fitted onto at least one of said first (2) and second (3) jaws.
2. The combing machine according to claim 1, **characterized in that** said comb (6) is mounted on the upper jaw (3) of said first and second jaws.
3. The combing machine according to claim 1, **characterized in that** said comb (6) is mounted on the lower jaw (2) of said first and second jaws.
4. The combing machine according to claim 1, **characterized in that** a comb (6) is mounted on each one of said first and second jaws (2, 3).
5. The combing machine according to one or more of the preceding claims, **characterized in that** said at least one comb (6) comprises a body (7) provided with at least one opening (8), which allows the inflow of compressed air, and at least one lower discharge opening (9) for the outflow of said compressed air in the form of a jet.
6. The combing machine according to claim 5, **characterized in that** said comb (6) is provided, in a downward region, with a plurality of openings (9) for emitting a plurality of jets of compressed air.
7. The combing machine according to one or more of the preceding claims, **characterized in that** said comb (6) is mounted on said upper jaw (3) at an angle with respect to the normal to the advancement direction of the combed cotton.
8. A comb for a combing machine for cotton and other

fibers, **characterized in that** it is of the pneumatic type.

9. The comb according to claim 8, **characterized in that** it comprises a body (7) provided with at least one opening (8) for introducing compressed air and at least one opening (9) for the emission of said compressed air in the form of an air jet. 5
10. The comb according to claim 9, **characterized in that** it can be mounted on at least one of an upper (3) and lower (2) jaws of a combing machine. 10

15

20

25

30

35

40

45

50

55

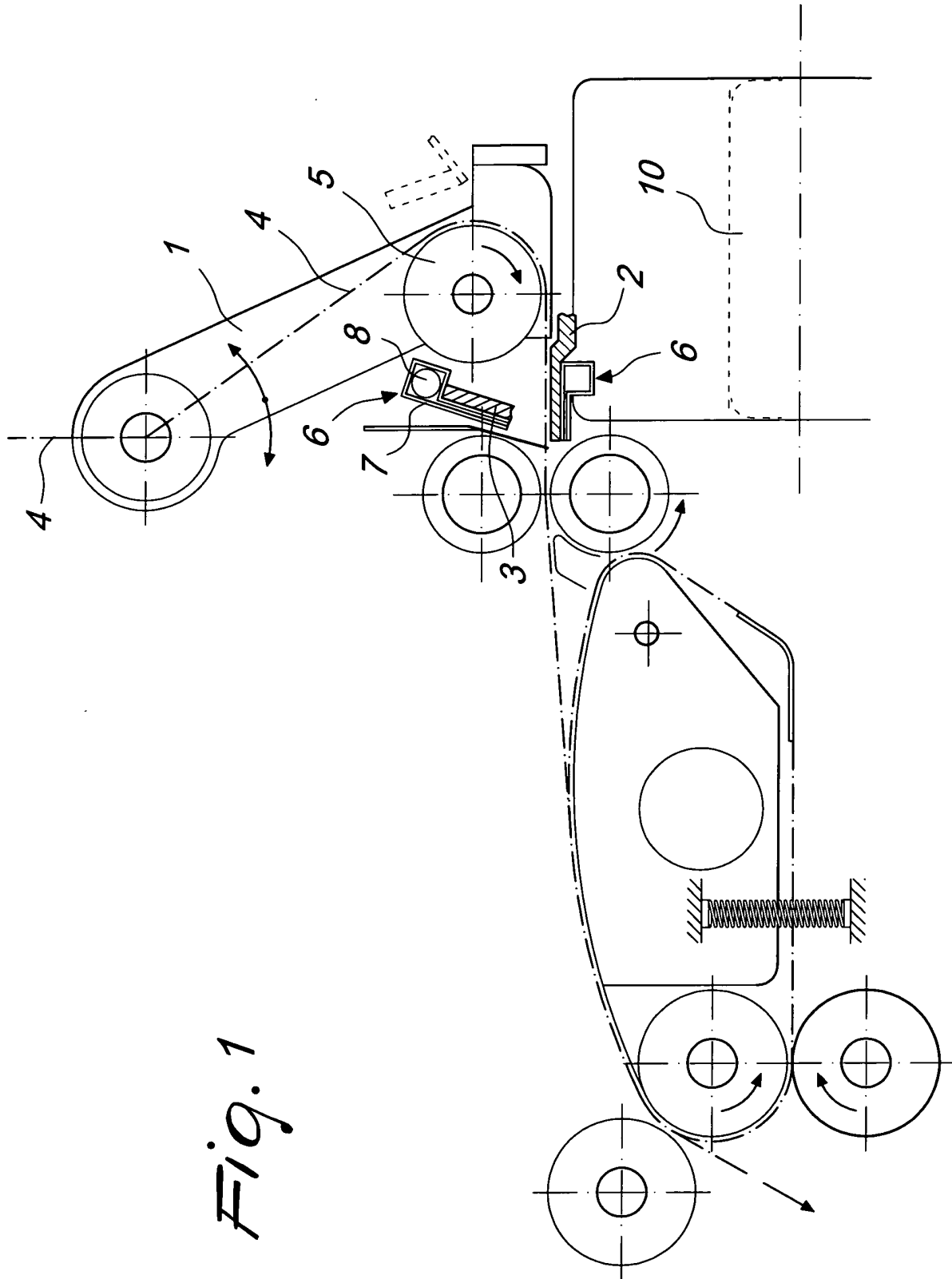


Fig. 1

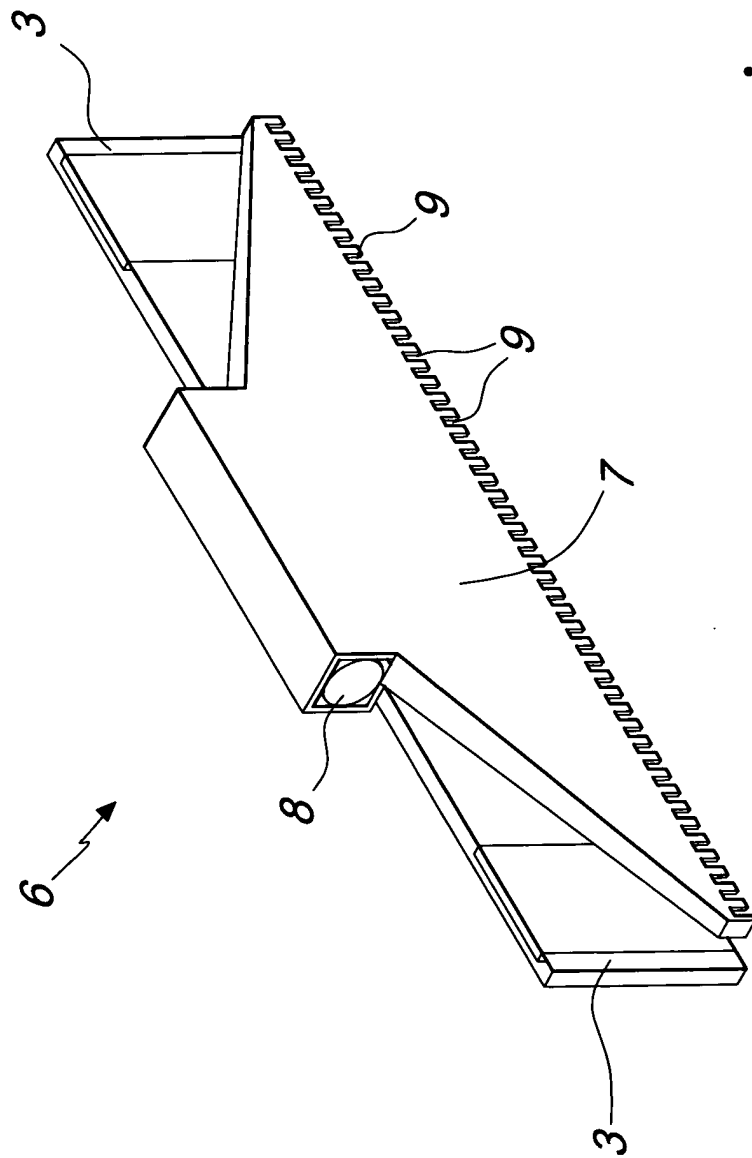


Fig. 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 00 0383

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)
A	FR 2 727 986 A (N SCHLUMBERGER ET CIE) 14 June 1996 (1996-06-14) * claim 1; figures 1,2 *	1,8	D01G19/10
A	EP 0 351 443 A (STAEDTLER & UHL) 24 January 1990 (1990-01-24) * claim 1; figures 5,6 *	1,8	
A	US 2003/019079 A1 (GRUBER PETER) 30 January 2003 (2003-01-30) * claims 1,4; figure 2 *	1,8	
A	US 3 103 041 A (NYDAM JOHN H) 10 September 1963 (1963-09-10) * column 2, line 17 - line 59; figure 1 *	1,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			D01G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 April 2005	Examiner D'Souza, J
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			

1
EPO FORM 1503 03.92 (P04C01)

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

EP 05 00 0383

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-04-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2727986 A	14-06-1996	FR 2727986 A1	14-06-1996
EP 0351443 A	24-01-1990	EP 0351443 A1	24-01-1990
		AT 76908 T	15-06-1992
		DE 3722481 A1	26-01-1989
		DE 3871788 D1	09-07-1992
		ES 2033381 T3	16-03-1993
		GR 3005119 T3	24-05-1993
		IN 168968 A1	27-07-1991
US 2003019079 A1	30-01-2003	DE 20003070 U1	20-04-2000
		AT 278055 T	15-10-2004
		AU 3373001 A	27-08-2001
		CN 1401025 A	05-03-2003
		DE 50103870 D1	04-11-2004
		WO 0161090 A1	23-08-2001
		EP 1255883 A1	13-11-2002
		JP 2003522854 T	29-07-2003
		TR 200402653 T4	22-11-2004
US 3103041 A	10-09-1963	CH 384424 A	15-11-1964
		GB 904297 A	29-08-1962