

①⑫ **EUROPEAN PATENT APPLICATION**

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⑤④ **A wide belt smooth sander.**

⑤⑦ In a wide belt smooth sander, a carpet conveyor (4) is arranged to extend longitudinally, and a sanding assembly (3) transversely of the carpet (4). The sanding assembly (3) is inclined to the longitudinal direction (F) of the carpet con-

veyor (4) at an angle of about 80°. A significant improvement in the quality of the resulting smoothing is achieved, especially where gloss lacquering is envisaged.

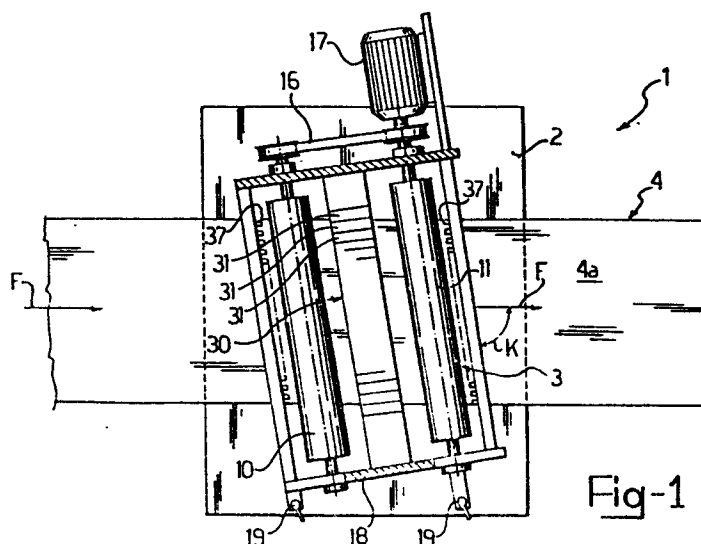


Fig-1

DESCRIPTION

This invention relates to a wide belt smooth sander of a type which comprises, mounted on a frame, a carpet conveyor for transporting workpieces which extends in a longitudinal direction, and a sanding assembly having a set of rollers whose parallel axes lie across and above said carpet conveyor and over which an abrasive belt is stretched, and a pressure device for the abrasive belt mounted between said rollers and extending parallel thereto to push said belt toward said carpet conveyor.

A machine of this general type is described in detail in Italian Patent Application No. 21417 B/81, filed on April 9, 1981 by this same Applicant.

This type of smooth sander is employed, inter alia, for finishing varnished panels which are then subjected to a polishing step to achieve a glossy lacquered effect.

Of course, the glossier is a panel lacquered surface, the more conspicuous become surface defects of the lacquered surface.

With conventional smooth sanders, the roller supporting the abrasive belt are mounted transversely to the carpet conveyor for the panels being processed, with their axes parallel to said carpet and perpendicular to the transport direction. Surface

defects most frequently found on finished panels include scratches extending in the panel direction of transport and being due to lumpiness of the abrasive belt.

In order to improve the sanding process, some manufacturers have suggested of impressing, either on the sanding assembly as a whole or just the pressure device for the abrasive belt, a reciprocating motion across the carpet direction of transport. The improvement to be achieved in the quality of the smoothed surface is, however, aleatory. Further, panels processed on such machines often exhibit noticeable zig-zag markings.

The problem underlying this invention is to provide a wide belt smooth sander which is so constructed and operated as to obviate the problems of the cited prior art.

This problem is solved by a smooth sander as indicated being characterized in that said sanding assembly is inclined from the perpendicular to the longitudinal direction of the carpet conveyor.

Advantageously, the axes of said rollers and said pressure device form an angle of about 80° with the longitudinal direction of the carpet conveyor.

By virtue of this angling, a finish is afforded for varnished and subsequently polished panels which eliminates all the surface defects due to smooth sanding to a substantial extent.

The features and advantages of the invention will become more clearly apparent from the following detailed description of a preferred but not exclusive embodiment thereof, shown by way of illustration in the accompanying drawings, where:

Figure 1 is a top plan view of a wide belt smooth sander according to the invention, with the sanding assembly sectioned

along the line I-I of Figure 2; and

Figure 2 is an enlarged scale fragmentary view of the sanding assembly of the machine of Figure 1.

With reference to the drawing figures, a wide belt smooth sander, generally indicated at 1, comprises a frame 2, a sanding assembly 3, and a carpet conveyor 4 having a longitudinal main direction and a working transport run 4a which extends between the assembly 3 and the frame 2.

The carpet conveyor 4 is arranged to feed a panel 5 in the direction of the arrow F to underneath the assembly 3. The direction F coincides with the longitudinal direction of the carpet 4.

The sanding assembly 3 includes a set of five rollers, respectively indicated at 10, 11, 12, 13 and 14, which are all mounted conventionally on a frame 9 with their axes parallel to one another and to the plane defined by the working run 4a of the carpet conveyor 4.

The rollers 10 and 11 are positioned directly above the working run 4a and are driven through a gear motor 17 and its related belt drive 16.

One end of the rollers 10 and 11 is journalled on a plate 18 which is attached to the frame 9 removably by screw fastening means 19, known per se. The rollers 12 and 13 are mounted idly on a yoke-like holder 20. Said holder 20 is carried on a beam 21 belonging to the frame 9 with the intermediary of a fluid-operated cylinder 22.

The roller 14 is mounted idly on a holder 23 carried by the frame 9 through a fluid-operated cylinder 24.

Around the rollers 10, 11, 14 there is trained an endless

flat drive belt 25, preferably of the laminated type. Trained around the rollers 10,11,12 and 13 is an endless abrasive belt 26 overlapping the belt 25 with the section extending between the rollers 10 and 11.

Said belts 25,26 are kept under working tension by the fluid-operated cylinders 22,24.

At a location between the rollers 10,11, there is mounted a pressure device 30 acting on the belts 25,26 to push them toward the run 4a of the carpet 4.

The pressure device 30 is known per se, extends parallel to the rollers 10-14, and comprises a plurality of independent operation shoes 31.

Between the shoes 31 and the belt 26, there intervenes a seal lined with a low frictional coefficient material such as a graphite based material.

Upstream and downstream of the sanding assembly 3, and above the rollers 12,13, there are provided suction devices, comprehensively indicated at 35 and being each provided with nozzles 36 oriented over the abrasive belt 26 to remove dust and chips from the sanding of a panel 5.

Also upstream and downstream of the assembly 3, there are carried on the frame 9 small wheels 37 adapted to hold the panel 5 being processed pressed against the run 4a of the conveyor 4.

The wheels 37 are spring mounted rotatably and independently. They have all rotation axes parallel and perpendicular to the direction F.

Their arrangement is such that they present themselves in staggered alignment, parallel and close to their respective

rollers 10,11.

This arrangement enables a panel 5 being processed to be held, even if of a small size, firmly adhered to the carpet 4 against the shear forces which are generated during the smooth sanding process and directed obliquely to the direction of transport of the panel.

The wheels 37 also function, in quite a conventional manner, as feelers to control the shoes 31.

As clearly shown in Figure 1, the sanding assembly 3 is mounted at an angle from the perpendicular to the longitudinal direction of the carpet conveyor 4. This inclined setting, as expressed in terms of the angle K formed between the axis of one of the rollers 10-14, or likewise, between the longitudinal direction of the pressure device 30 and the longitudinal direction of the carpet conveyor 4 (arrow F), is within the range of about 80° to about 89°.

It has been found that values of the angle K close to 80 degrees afford, on finish-smoothing a panel 5, a finished surface of said panel which is virtually free of scratches or other surface defects.

With the machine 1 in operation, a panel 5 being processed would be fed to the sanding assembly 3 in the direction of the arrow F. The abrasive belt 26 is driven from the gear motor 17 at a desired working speed.

The abrasive belt 26 is held, at the pressure device 30, pressed against the top surface of the panel 5, the panel being moved in one one with the run 4a of the carpet 4 on account of the pressure force applied to it by the wheels 37.

Thus, the smooth sander of this invention solves the

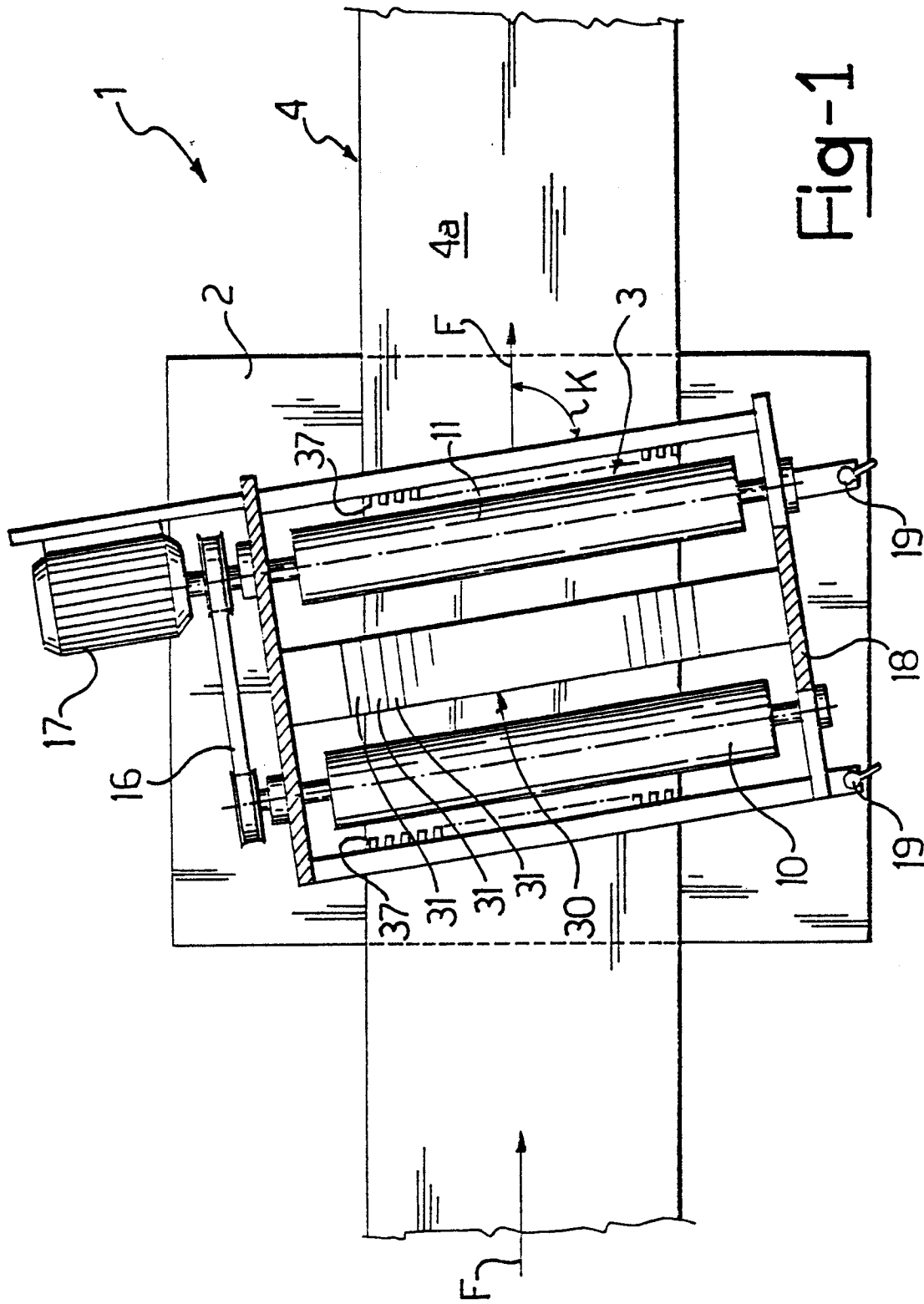
problem set forth, and affords a number of advantages over comparable conventional machines. In particular, it ensures high quality finish of the panels even where relatively coarse grit belts are employed, with great savings in terms of belt consumption. Furthermore, any sanding marks left by lumps of the abrasive are obliterated from the smooth sanded panels.

CLAIMS

1. A wide belt smooth sander comprising, mounted to a frame (7), a carpet conveyor (4) for the workpieces extending in a longitudinal direction, a sanding assembly (3) having a set of rollers (10-13) whose axes lie across and above said carpet conveyor (4) and having an abrasive belt (26) stretched thereover, and a pressure device (3) for the abrasive belt (26) mounted between said rollers (10-13) and lying parallel thereto to push said belt (26) toward said carpet (4), characterized in that said sanding assembly (3) is inclined from the perpendicular to the longitudinal direction (F) of the carpet conveyor (4).

2. A smooth sander according to Claim 1, characterized in that the axes of said rollers (10-13) form, with said longitudinal direction (F) of the carpet conveyor (4), an angle within the range of about 80° to about 89°.

3. A smooth sander according to either Claim 1 or 2, characterized in that it comprises, upstream and downstream of said sanding assembly (3), a plurality of small pressure wheels (37) for a panel being processed on said carpet (4), said wheels (37) being arranged close against corresponding ones of said rollers (10,11) in staggered alignment parallel to the axes of said rollers (10,11).



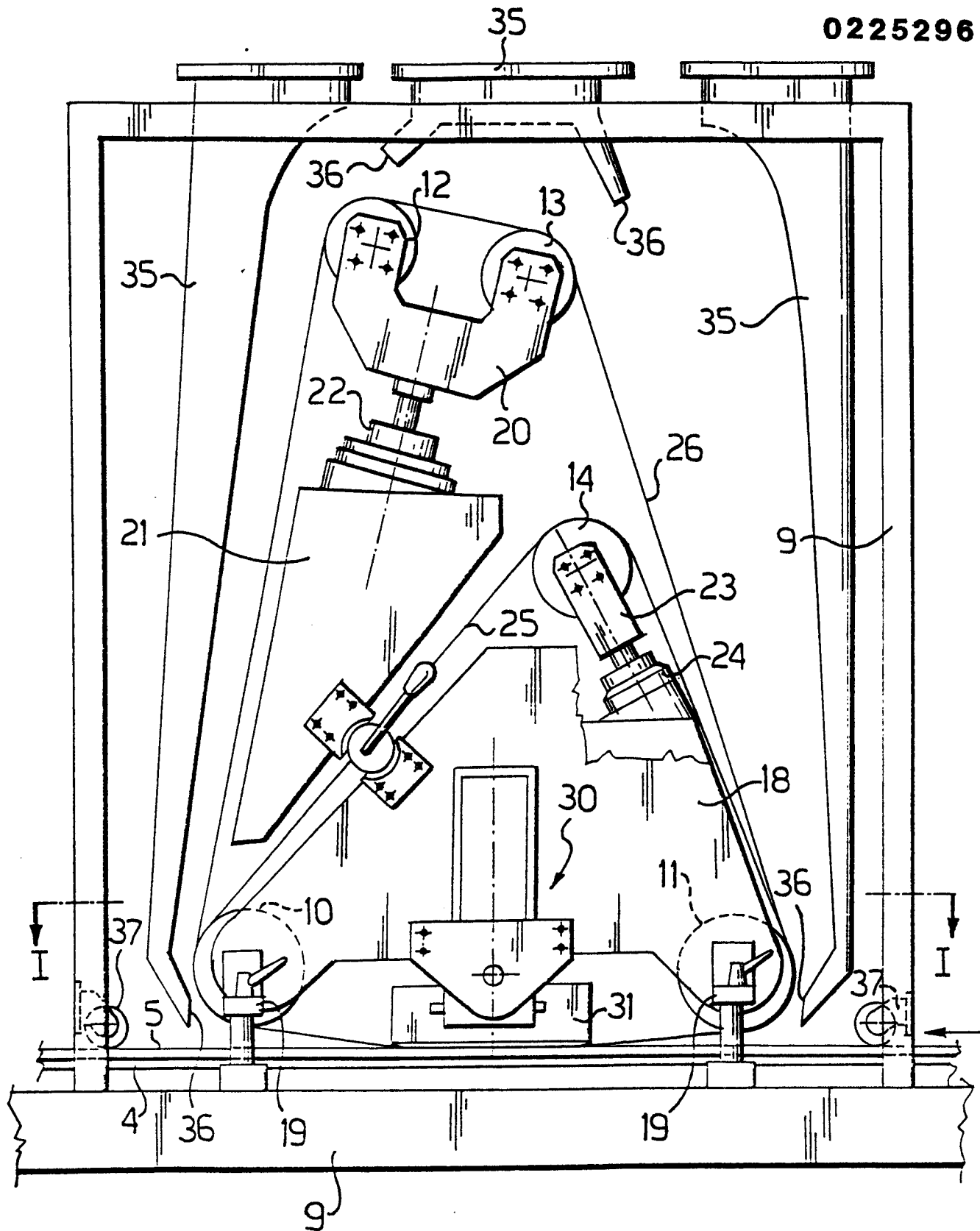


Fig-2



EP 86 83 0292

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. 4)
Y	DE-U-7 912 841 (VICHI) * claim 1; figure 1 *	1	B 24 B 21/10
Y	DE-A-3 029 591 (STEINEMANN) * claim 1; page 5, lines 7-12; figures 1, 2 *	1	
Y	US-A-3 269 065 (NYLUND) * column 8, line 48 - column 9, line 15; figures 1, 2 *	1	
A		2	
A	DE-U-1 995 879 (STÄHLE) * claim 1; figure 1 *	1	
A	GB-A-1 249 785 (TIMESAVERS SANDERS) * claims 1, 3; figure 3 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
A	DE-U-1 995 881 (WIDU) * claims 1, 2; figure *	1	B 24 B 21/00
A	DE-B-1 091 313 (CARSTENS) * complete document *	1	
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 16-10-1987	Examiner MARTIN A E W
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			



DOCUMENTS CONSIDERED TO BE RELEVANT			Page 2												
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)												
A	GB-A-1 142 731 (CARBORUNDUM) * page 3, lines 40-44; figure 1 *	3													
A	FR-A-1 477 901 (ANONIMA CASTELLI) * page 2, left-hand column, lines 32-44; figure 1 *	3													
A	US-A-3 374 583 (JACOBI) * column 4, lines 1-9; figures 3, 4 *	3													
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<table border="0"><tr><td>CATEGORY OF CITED DOCUMENTS</td><td></td></tr><tr><td>X particularly relevant if taken alone</td><td>T : theory or principle underlying the invention</td></tr><tr><td>Y particularly relevant if combined with another document of the same category</td><td>E : earlier patent document, but published on, or after the filing date</td></tr><tr><td>A technological background</td><td>D : document cited in the application</td></tr><tr><td>C non-written disclosure</td><td>L : document cited for other reasons</td></tr><tr><td>P intermediate document</td><td>& : member of the same patent family, corresponding document</td></tr></table>				CATEGORY OF CITED DOCUMENTS		X particularly relevant if taken alone	T : theory or principle underlying the invention	Y particularly relevant if combined with another document of the same category	E : earlier patent document, but published on, or after the filing date	A technological background	D : document cited in the application	C non-written disclosure	L : document cited for other reasons	P intermediate document	& : member of the same patent family, corresponding document
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