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

(11) **EP 4 386 119 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
03.07.2024 Bulletin 2024/27

(43) Date of publication A2:
19.06.2024 Bulletin 2024/25

(21) Application number: **23210108.9**

(22) Date of filing: **15.11.2023**

(51) International Patent Classification (IPC):
D01D 5/16 *(2006.01)* ***D01D 10/02*** *(2006.01)*
D02J 13/00 *(2006.01)* ***D02J 1/22*** *(2006.01)*
D01D 13/02 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
D02J 1/22; D01D 5/16; D01D 10/02; D01D 13/02; D02J 13/005

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(30) Priority: **16.12.2022 JP 2022201253**

(71) Applicant: **TMT Machinery, Inc.**
Osaka-shi, Osaka 541-0041 (JP)

(72) Inventors:
- **SUZUKI, Jumpei**
Kyoto-shi, Kyoto, 612-8686 (JP)
- **TSUJI, Takahiro**
Kyoto-shi, Kyoto, 612-8686 (JP)

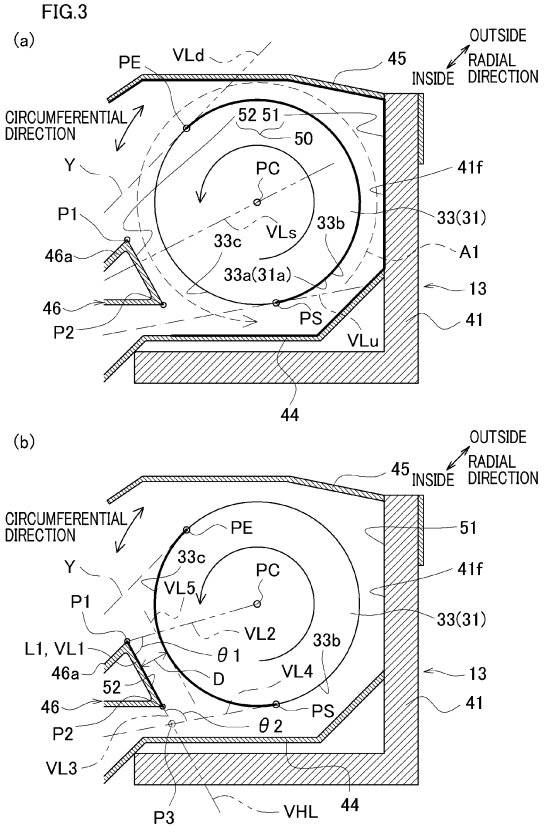
(74) Representative: **Hoffmann Eitle**
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

(54) SPUN YARN DRAWING APPARATUS

(57) An object of the present invention is to suppress yarn swing and the increase in power consumption in a spun yarn drawing apparatus.

A spun yarn drawing apparatus 3 includes three or more heating rollers 31 and a thermal insulation box 13 housing these heating rollers 31. A yarn Y is wound onto the three or more heating rollers 31 at a winding angle of less than 360 degrees, and these heating rollers 31 are configured to heat and send the yarn Y to the downstream side in a yarn running direction. The three or more heating rollers 31 include a first heating roller 32, a second heating roller 33, and a third heating roller 34. The thermal insulation box 13 includes a circulator 50 which is provided around the second heating roller 33 and which is configured to cause a roller accompanied flow generated by rotation of the second heating roller 33 to circulate around the entire second heating roller 33 in its circumferential direction.

FIG.3



EP 4 386 119 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 23 21 0108

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP 2015 055020 A (TMT MACHINERY INC) 23 March 2015 (2015-03-23)	1-10, 13-16, 21,24	INV. D01D5/16 D01D10/02
Y	* paragraphs [0008], [0026], [0028], [0034], [0043]; figure 3 *	17-20, 22,23,25	D02J13/00 D02J1/22
A		11,12	D01D13/02

Y	CN 113 832 557 A (TMT MACHINERY INC) 24 December 2021 (2021-12-24)	17-20	
A	* claims 1-12; figure 2 *	1-16, 21-25	

Y	EP 3 012 356 A1 (TMT MACHINERY INC [JP]) 27 April 2016 (2016-04-27)	22,23,25	
A	* paragraphs [0023], [0031], [0033], [0044], [0035], [0045], [0053], [0063], [0074]; figures 1,2,3 *	1-21,24	

TECHNICAL FIELDS SEARCHED (IPC)

D01D
D02J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 May 2024	Van Beurden-Hopkins

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 23 21 0108

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.

21-05-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2015055020 A	23-03-2015	CN 104451923 A	25-03-2015
		DE 102014218189 A1	12-03-2015
		JP 6088948 B2	01-03-2017
		JP 2015055020 A	23-03-2015
		TW 201510229 A	16-03-2015
CN 113832557 A	24-12-2021	CN 113832557 A	24-12-2021
		EP 3929337 A1	29-12-2021
		JP 2022008091 A	13-01-2022
EP 3012356 A1	27-04-2016	CN 105525372 A	27-04-2016
		EP 3012356 A1	27-04-2016
		JP 6484425 B2	13-03-2019
		JP 2016079539 A	16-05-2016

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82