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(54) **FIXING DEVICE AND IMAGE FORMING APPARATUS INCORPORATING SAME**

(57) A fixing device (7) includes an endless fixing belt (22), a pressing member (23) configured to press an outer surface of the fixing belt (22), a heater (31) disposed inside a loop of the fixing belt (22) and configured to heat the fixing belt (22), and a nip formation pad (32) disposed inside the loop of the fixing belt (22). The nip formation

pad (32) has a nip formation surface (32c) configured to contact the pressing member (23) to form a fixing nip and a projection (32c) at a position different from an end portion of the nip formation pad (32) in a conveyance direction of a recording medium. The projection (32c) is on a surface opposite the nip formation surface (32a1).

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EUROPEAN SEARCH REPORT

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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 A	US 2018/059597 A1 (YAMAGISHI YOSHIHIRO [JP] ET AL) 1 March 2018 (2018-03-01) * paragraph [0034]; figures 3,5 *	1,2,5,8, 12,15 3,4,6	INV. G03G15/20
X A	US 2018/335733 A1 (MATSUDA RYOHEI [JP] ET AL) 22 November 2018 (2018-11-22) * paragraph [0065]; figure 3 *	1,2,9, 10,12,15 3,4,6	
X	US 2018/196378 A1 (TAKAGI KENJI [JP] ET AL) 12 July 2018 (2018-07-12) * paragraphs [0084] - [0087]; figures 12B,13B *	1,2,13, 15	
X A	US 2018/032005 A1 (SATO NORIAKI [JP]) 1 February 2018 (2018-02-01) * paragraphs [0025], [0047] - [0050]; figures 6a, 7 *	1,11 14	
X	US 2009/208264 A1 (FUJIWARA HIDEHIKO [JP] ET AL) 20 August 2009 (2009-08-20) * paragraphs [0093], [0188]; figure 16 *	1,2,11, 14	
A	US 2015/293481 A1 (TAKAHASHI HIRONORI [JP] ET AL) 15 October 2015 (2015-10-15) * paragraphs [0046] - [0049]; figure 7 *	11	TECHNICAL FIELDS SEARCHED (IPC) G03G
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 September 2020	Examiner Urbaniec, Tomasz
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			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

1-6, 8-15

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 3-6, 8-10, 12, 13, 15(completely); 1, 2(partially)

A fixing device having a nip formation pad provided with a plurality of projections arranged in the conveyance direction of the recording medium on a surface opposite the nip formation surface, the projections differing in height.

2. claims: 7(completely); 1, 2(partially)

A fixing device having a nip formation pad provided with a projection at a position different from an end portion of the nip formation pad in a conveyance direction of a recording medium, the projection being on a surface opposite the nip formation surface, wherein the projection extends in a width direction of the fixing belt, and a height of a center area of the projection in the width direction is higher than a height of an end area of the projection.

3. claims: 11, 14(completely); 1, 2(partially)

A fixing device having a nip formation pad provided with a projection at a position different from an end portion of the nip formation pad in a conveyance direction of a recording medium, the projection being on a surface opposite the nip formation surface, wherein the surface including the projection opposite the nip formation surface is coated with a heat-absorbing material, or, wherein an end face of the projection in a direction in which the projection projects is an inclined surface facing the heater.

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

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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
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