

PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

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**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year)

04 DEC 2018

Applicant's or agent's file reference  
031407.01631

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.  
PCT/US 18/51983

International filing date (day/month/year)  
20 September 2018 (20.09.2018)

Priority date (day/month/year)  
29 September 2017 (29.09.2017)

International Patent Classification (IPC) or both national classification and IPC  
IPC(8) - F01D 17/06 (2018.01)  
CPC - F03D 3/04; F03D 3/0409; F03D 3/0454; F01D 17/00; F01D 17/06

Applicant MOOG INC.

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Date of completion of this opinion  23 November 2018	Authorized officer  Lee W. Young  PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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International application No.

PCT/US 18/51983

## Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
- the international application in the language in which it was filed.
- a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2.  This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).
3.  With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
- a.  forming part of the international application as filed:
- in the form of an Annex C/ST.25 text file.
- on paper or in the form of an image file.
- b.  furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
- c.  furnished subsequent to the international filing date for the purposes of international search only:
- in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
- on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4.  In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	<u>1-18</u>	YES
	Claims	<u>NONE</u>	NO
Inventive step (IS)	Claims	<u>1-18</u>	YES
	Claims	<u>NONE</u>	NO
Industrial applicability (IA)	Claims	<u>1-18</u>	YES
	Claims	<u>NONE</u>	NO

2. Citations and explanations:

Claims 1-18 meet the criteria set out in PCT Article 33(2)-(3) because the prior art does not teach or fairly suggest the subject matter claimed.

The prior art is exemplified by US 2017/0090505 A1 to Moog Inc (hereinafter 'Moog') and US 2013/0157768 A1 to Long, JR. et al. (hereinafter 'Long').

With regards to claim 1: Moog discloses an apparatus for connecting a rotational drive member to a rotational driven member (para [0008] -The invention provides a stop mechanism for preventing overtravel in a drive system having a motor, a drive shaft rotated by the motor, and an output element rotatably or linearly driven by rotation of the drive shaft.), the apparatus comprising: a structural ground (para [0022], [0024] -As may be understood, when bell-crank link 30 is caused to pivot in the first pivot direction, second leg 34 engages an adjacent frictional brake plate 25 of first brake 24A and compresses the stack of brake plates 25 to frictionally brake the plates against structural ground SG.); an input element rotatable relative to the structural ground (para [0023] -Brake plates 25 of first and second brakes 24A, 24B are respectively mounted on first and second one-way clutched 22A, 22B in splined fashion such that the brake plates 25 rotate with the associated one way-clutch and are axially displaceable relative to the associated one-way clutch to enable the brake plates 25 to be compressed against structural ground SG.); an output element rotatable relative to the structural ground (para [0029] -In the depicted embodiment, bell-crank link 50 is mounted to pivot about a pivot axis defined by a pivot pin 51 connected to a structural ground, and has a first leg 52 and a second leg 54 angularly offset from first leg 52. First leg 52 is arranged to be engaged by first stop feature 26A as output element 18 reaches a predetermined angular position about axis 19 when rotating in first driven direction F'. The angular position is chosen to correspond with an end-of-stroke position in first drive direction F. This engagement of first leg 52 by first stop feature 26A causes pivotal motion of bell-crank link 50 in a first pivot direction (clockwise in FIG. 3; counter-clockwise in FIG. 4). First leg 52 is also arranged to be engaged by second stop feature 26B as output element 18 reaches a predetermined angular position about axis 19 when rotating in second driven direction R', wherein the angular position is chosen to correspond with an end-of-stroke position in second drive direction R.); a torque limiter connecting the output element to the input element for rotation with the input element, wherein the torque limiter is actuated to brake rotation of the input element and the output element, or to disconnect the input element from the output element, when torque transmitted between the input element and the output element exceeds a torque limit (para [0026], [0027] -In an optional enhancement of stop mechanism 20, torque modulation of the disc brakes using "bungee" loaded springs may be implemented to attenuate the normal increasing torque experienced during application of the disc brakes. For example, the torque may be limited to a preset level, or the torque may increase at a different rate after a certain predetermined torque has been attained.). Moog does not disclose an over-speed governor configured to cause actuation of the torque limiter to brake rotation of the input element and the output element, or to disconnect the input element from the output element, when rotational speed of the input element exceeds a rotational speed limit.

Long discloses an apparatus for connecting a rotational drive member to a rotational driven member (para [0030] -The automatically resetting torque limiter 10 includes two relatively rotary members 12, 14, one of the members 12 or 14 drivingly connected to a source of power 13 such as an electric motor, the other of the members 12 or 14 drivingly connected to driven machinery 15.), the apparatus comprising: a torque limiter connecting the output element to the input element for rotation with the input element, wherein the torque limiter is actuated to brake rotation of the input element and the output element, or to disconnect the input element from the output element, when torque transmitted between the input element and the output element exceeds a torque limit (para [0044]-[0047] -As described above, the displacement of the engagement rollers produced by the curve of the engagement surface 16 must produce smooth accelerations of the rollers 20 when ascending the lobes 16A, in order to avoid shocks when the torque limiter 10 is running released or when resetting).

Long does not disclose a structural ground; an input element rotatable relative to the structural ground; an output element rotatable relative to the structural ground; and an over-speed governor configured to cause actuation of the torque limiter to brake rotation of the input element and the output element, or to disconnect the input element from the output element, when rotational speed of the input element exceeds a rotational speed limit.

The prior art of record, either alone or in an obvious combination, does not disclose or fairly suggest an over-speed governor configured to cause actuation of the torque limiter to brake rotation of the input element and the output element, or to disconnect the input element from the output element, when rotational speed of the input element exceeds a rotational speed limit.

Claims 2-18 meet the criteria set out in PCT Article 33(2)-(3) as depending from claim 1.

Claims 1-18 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.