

# PATENTS

## DIE CASTING



### The Director of the United States Patent and Trademark Office

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

### United States Patent

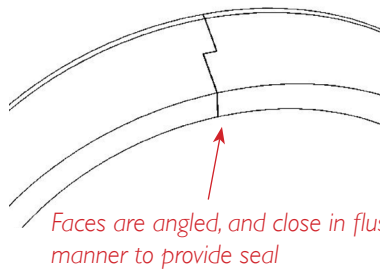
Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United State of America, and if the invention is a process, of the right to exclude other from using, offering for sale or selling throughout the United State of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.



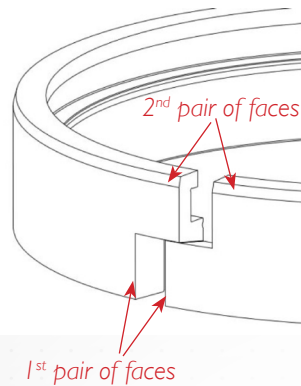
Many of Castool products and processes are **"PATENTED"**

This outlines what to look for when identifying product or technologies that possibly overlap with CASTOOL patents.

### PLUNGER TIPS



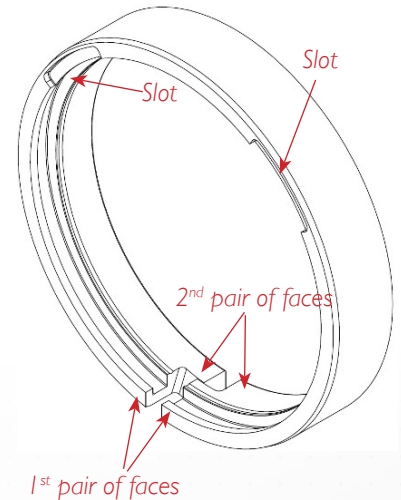
WEAR RING FOR DIE-CASTING PISTON



What we are looking for:  
**ANY Wear Ring for a Die-Casting Piston having:**

- Ring-shaped body with cut having 2 pairs of opposing faces
- Opposing faces are angled to allow faces to contact each other flush manner when ring is compressed

### IMPROVED WEAR RING WITH SLOTS

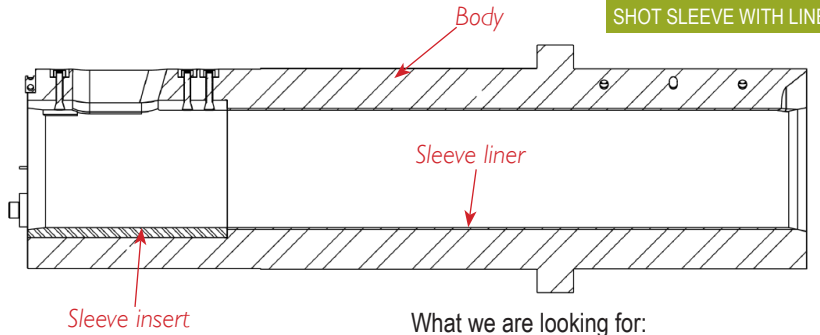


What we are looking for:  
**ANY Wear Ring for a Die-Casting Piston having:**

- Ring-shaped body with cut having 2 pairs of opposing faces
- One or more slots on face of body

SOME OF DIE CASTING PATENT

## SHOT SLEEVE

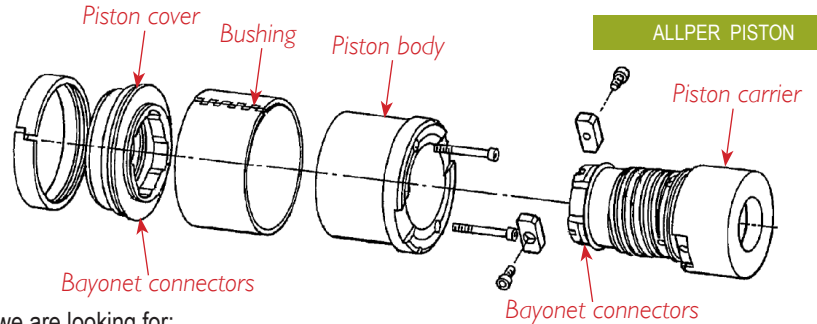


SHOT SLEEVE WITH LINER

What we are looking for:  
**ANY Die-Casting Shot Sleeve having:**

- Body having an axial bore
- Sleeve liner formed on bore surface
- Sleeve insert abutting the liner

## ALLPER



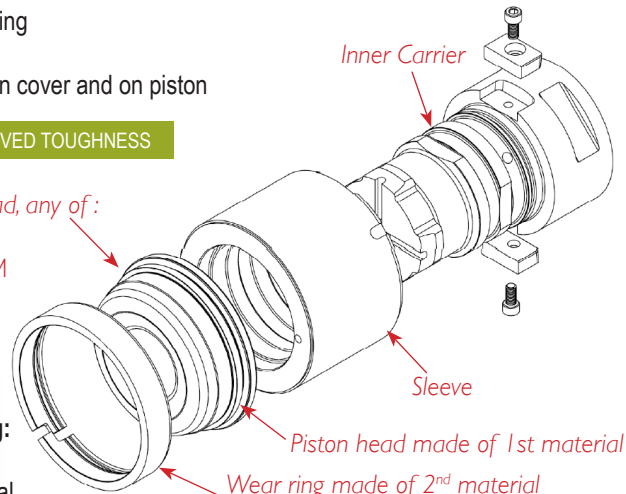
ALLPER PISTON

What we are looking for:  
**ANY Die-Casting Piston having:**

- Piston cover
- Piston body supporting bushing
- Piston carrier
- Bayonet connectors on piston cover and on piston

## DIE-CASTING PISTON WITH IMPROVED TOUGHNESS

Piston head, any of:  
AISI 4340  
AISI 300M  
AISI 4140



What we are looking for:  
**ANY Die-Casting Piston having:**

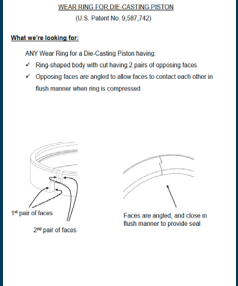
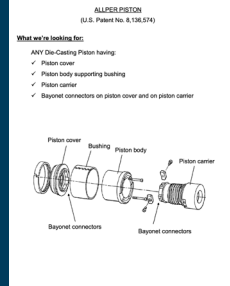
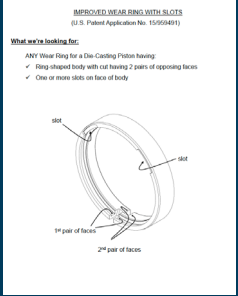
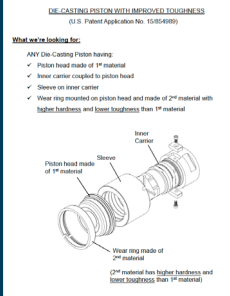
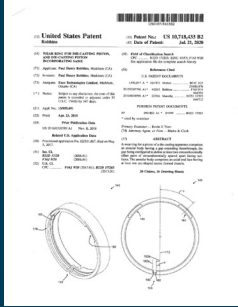
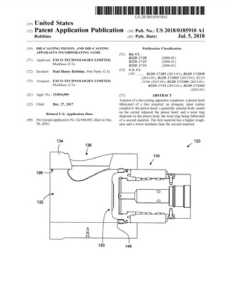
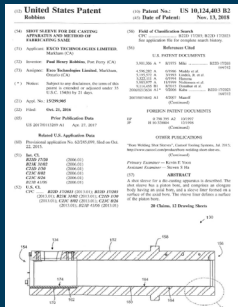
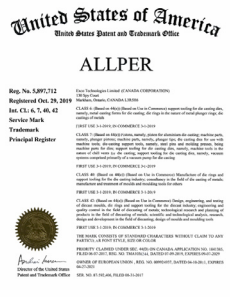
- Piston head, made 1<sup>st</sup> material
- Inner carrier coupled to piston head
- Sleeve on inner carrier
- Wear ring mounted on piston head and made of 2<sup>nd</sup> material with higher hardness and lower toughness than 1<sup>st</sup> material

Wear ring made of 2<sup>nd</sup> material  
(2<sup>nd</sup> material has higher hardness and lower toughness than 1<sup>st</sup> material)

- Piston head, made of any of AISI grade 4340, 300M or 4140 steel
- Inner carrier coupled to piston head
- Sleeve on inner carrier
- Wear ring mounted on piston head

If you see any product or technology that has ALL of the features identified by a checkmark, Please contact PAUL ROBBINS

If you need any more information please contact **CASTOOL**



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