



Clutches and Shaft Couplings

The very designation of these machine parts - Shaft couplings defines their basic use. Shaft couplings are thus parts of machines used to connect shafts. Shaft couplings must primarily transmit the torque during rotation and perform other tasks such as eliminating expansion joints, tuning the entire system, securing the entire system, ensuring start-up, etc. The attention of designers is often focused mainly on those "other" tasks of shaft couplings, which in the final solution may be the primary task (such as flexible couplings). We can divide shaft couplings on the basis of several criteria, namely:

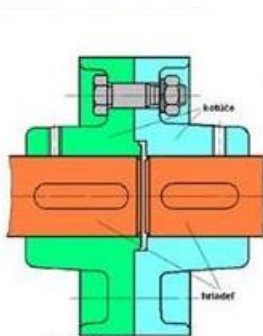
- According to the purpose of use.
- By design.
- Depending on the control method.
- Etc.

In the following fig. are illustrative examples of several types of shaft couplings, the calculation and detailed conditions of which will be explained in the lecture.

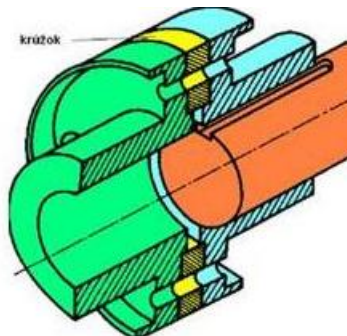
Rigid couplings



Split – Muff coupling



Flanged coupling



Chain coupling



Friction disk clutches



Disc clutch

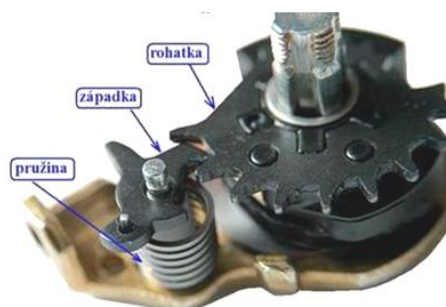
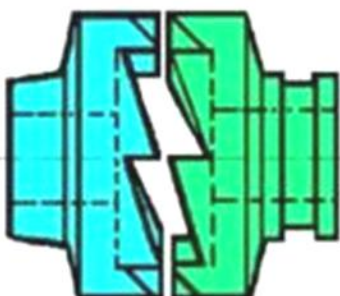


Multidisc clutch

Centrifugal clutch



One-way clutch

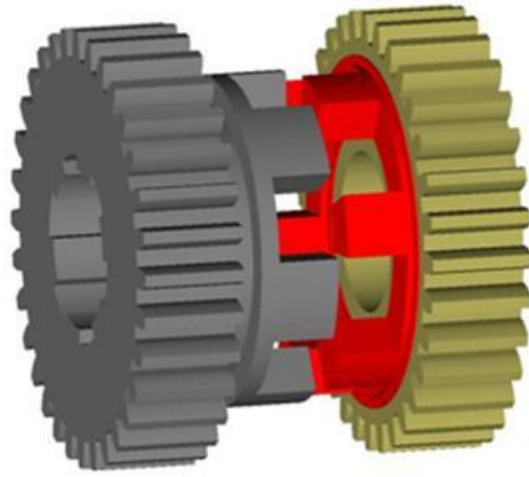




Gear coupling

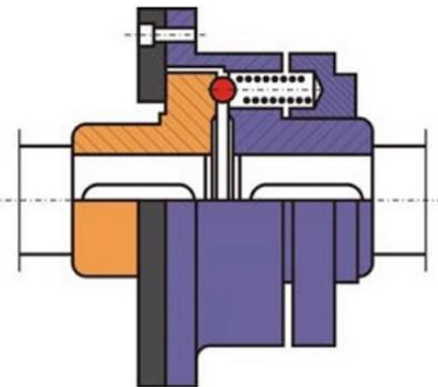


Gear coupling

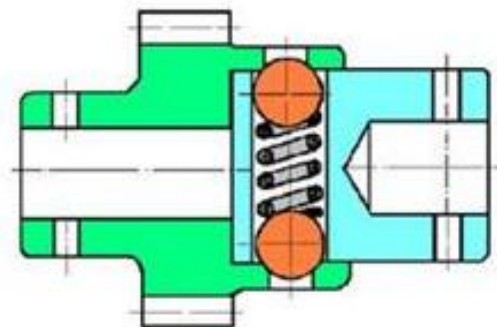


Side Gear coupling

Safety clutches – torque limiter

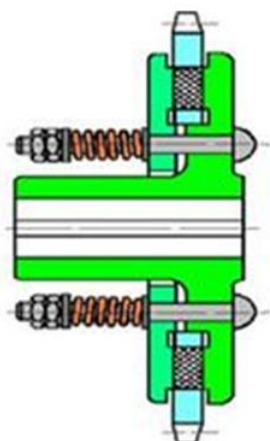


Axial balls

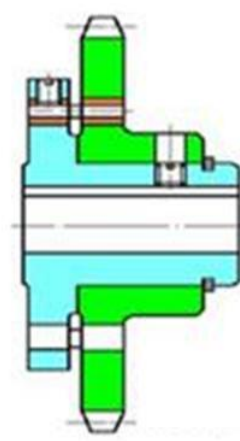


Radial balls

Ball Type Torque Limiter Coupling Safety Clutch



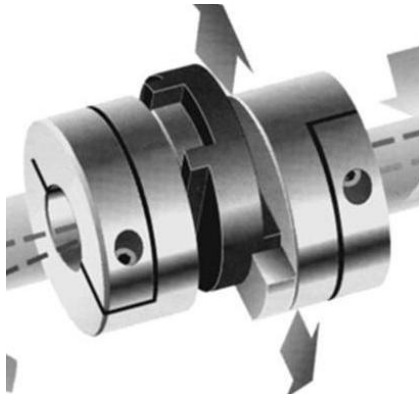
Friction Type Torque Limiter Coupling



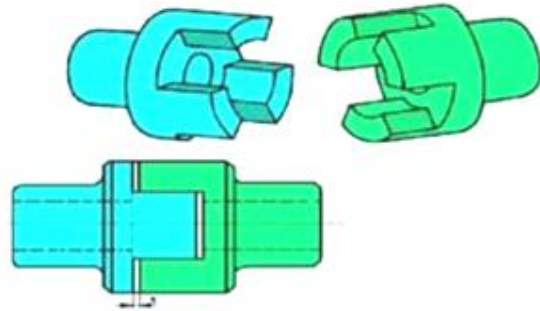
Pin Type Torque Limiter Coupling



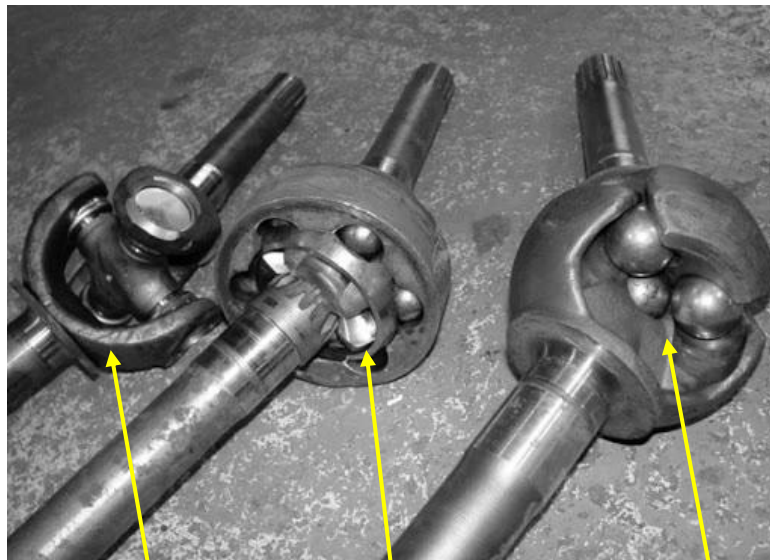
Misaligned coupling



Oldham coupling



Jaw coupling



Universal coupling - Universal joint, Homokinetic joint, Spherical joint.

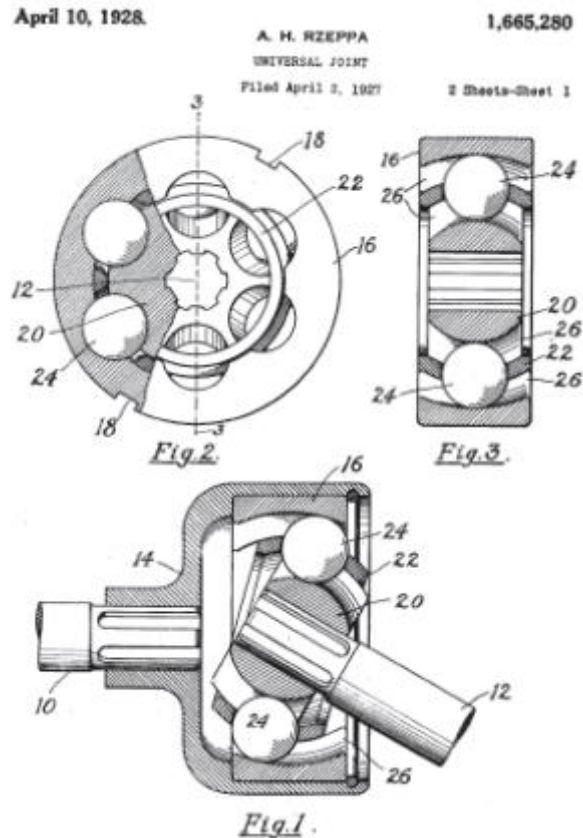


Outer CV joint



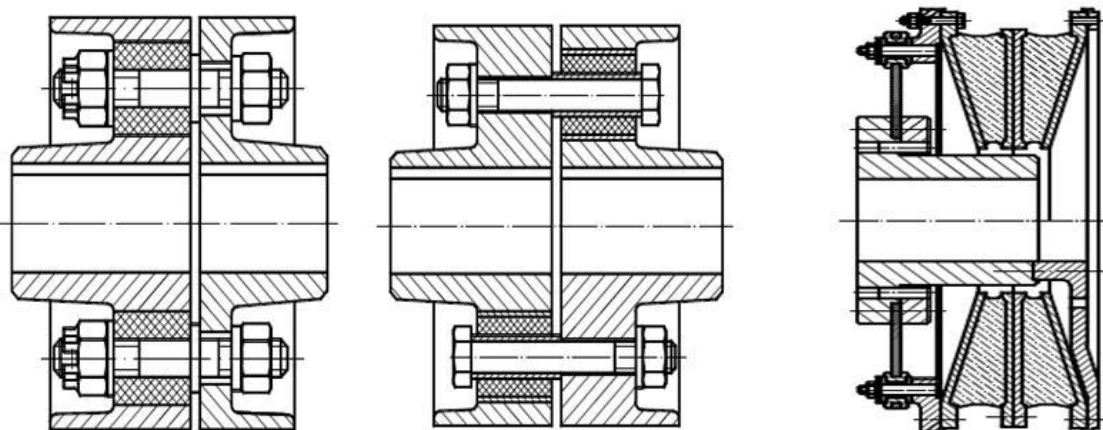
Inner CV joint



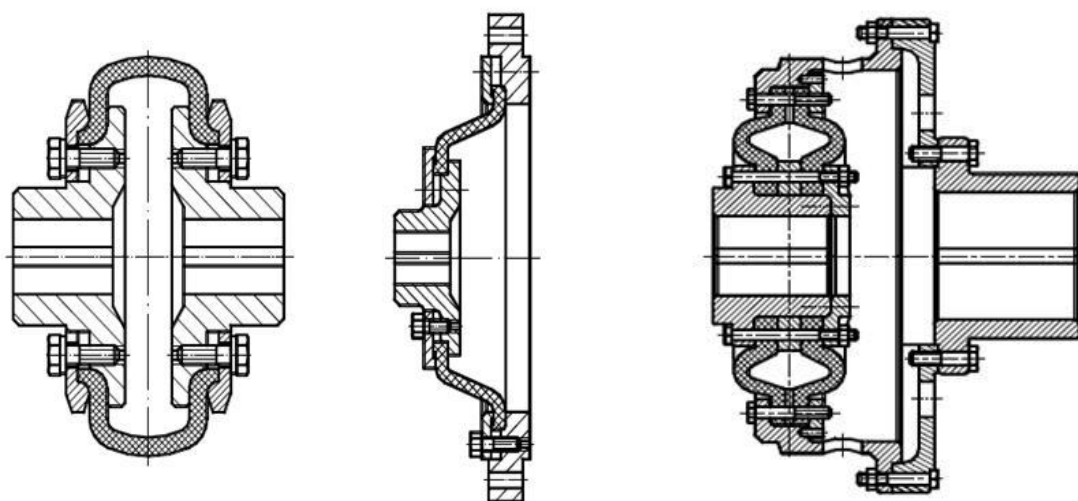


Rzeppa, Alfred H.: Patentový spis US 1, 665, 280 Universal Joint, US Patent Office, 1928

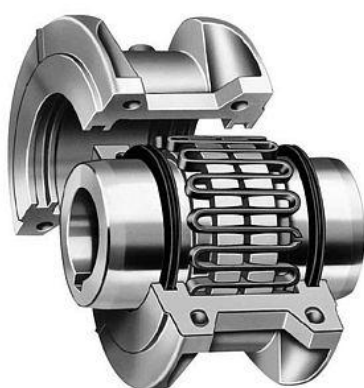
Flexible coupling



Rubber flexible coupling



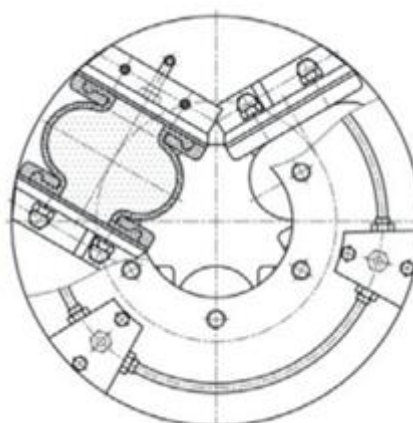
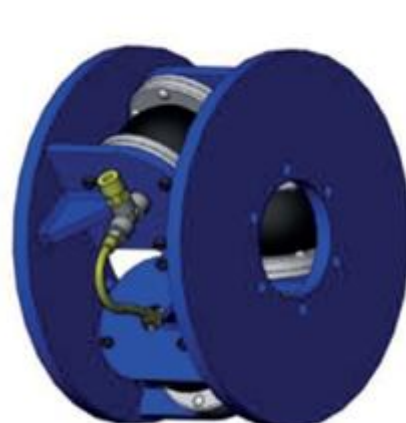
Rubber flexible coupling



Bibbi coupling



Dual mass flywheel

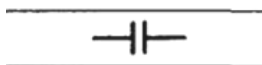


Pneumatic flexible coupling



Schematic of coupling

Clutch – generally



Still coupling



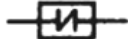
Rigid



Misaligned



Flexible



Controlled coupling

Friction



Friction one side



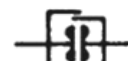
Friction both side



Gear coupling one side



Hydraulic



Electric



Self controlled clutch

Generally



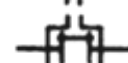
Centrifugal clutch



One way clutch



Torque limiter with
destruction element



Torque limiter



Brake

