



HW06

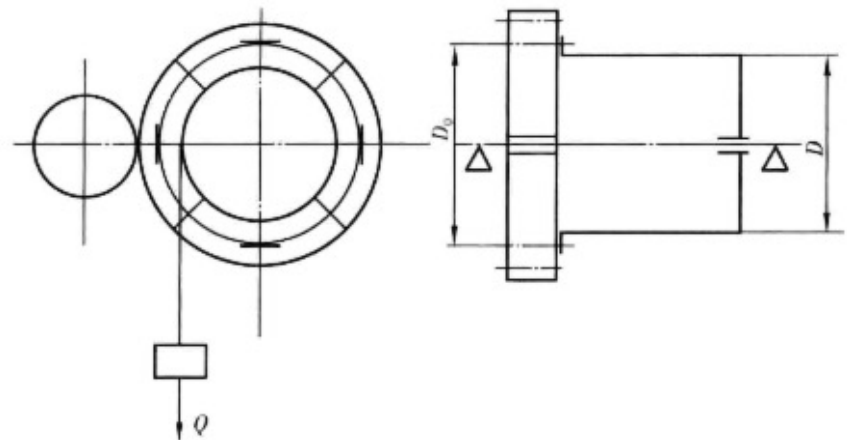
第05章 连接及连接件 作业

南方科技大学

HW 06.1

起重卷筒与大齿轮用8个普通螺栓连接在一起，如图所示。已知卷筒直径 $D = 400 \text{ mm}$ ，螺栓分布圆 $D_0 = 500 \text{ mm}$ ，接合面间摩擦系数 $f = 0.12$ ，可靠性系数 $K_f = 1.2$ ，起重钢索拉力 $Q = 50000 \text{ N}$ ，螺栓材料的许用拉伸应力 $[\sigma] = 100 \text{ MPa}$ 。试设计该螺栓组的螺栓直径。

A lifting reel is connected to a large gear with 8 ordinary bolts as shown in the figure. It is known that the diameter of the reel $D = 400 \text{ mm}$, the bolt distribution circle $D_0 = 500 \text{ mm}$, the coefficient of friction between the joint surfaces $f = 0.12$, the reliability coefficient $K_f = 1.2$, lifting cable tension $Q = 50,000 \text{ N}$, and permissible tensile stress of the bolt material $[\sigma] = 100 \text{ MPa}$. try to design the bolt diameter of this bolt group.



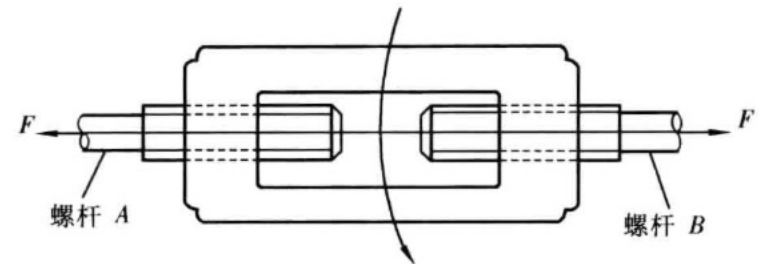
HW 06.2

如图所示为一螺旋拉紧装置，旋转中间零件，可使两端螺杆A和B向中央移近，从而将被拉两零件拉紧。已知：螺杆A和B的螺纹为M16($d_1=13.835\text{mm}$)，单线；其材料许用拉伸应力 $[\sigma]=80\text{MPa}$ ；螺纹副间摩擦系数 $f=0.15$ 。试计算允许施加于中间零件上的最大转矩 T_{\max} ，并计算旋紧时螺旋的效率 η 。

M16螺纹的相关参数：大径 $d = 16\text{ mm}$ ；中径 $d_2 = 14.701\text{ mm}$ ；螺距 $p = 2\text{ mm}$ ；

A screw tensioning device is shown in the figure, rotating the middle part can make the two ends of the screw A and B move closer to the center, so as to tighten the two parts being pulled. It is known that the threads of screws A and B are M16 ($d_1 = 13.835\text{ mm}$), single thread; their material allowable tensile stress $[\sigma] = 80\text{ MPa}$; and the coefficient of friction between the threaded pairs, $f = 0.15$. Calculate the maximum torque, T_{\max} , allowed to be applied to the intermediate parts, and calculate the efficiency of the screws during tightening. Calculate the maximum permissible torque T_{\max} on the intermediate part and calculate the efficiency of the screw during tightening.

Parameters related to M16 thread : large diameter $d = 16\text{ mm}$; medium diameter $d_2 = 14.701\text{ mm}$; pitch $p = 2\text{ mm}$;



HW 06.3

某带式输送机传动系统中，已知电动机功率 $P = 13.69 \text{ kW}$, $n = 136.4 \text{ r/min}$ ，电动机轴的直径和减速器输入轴的直径均为42mm。请选择一种联轴器（固定刚性联轴器、可移式刚性联轴器、弹性套柱联轴器、弹性柱销联轴器、轮胎式联轴器）给出相应理由，并计算转矩。

工况系数 $K_A = 1.5$

In a belt conveyor drive system, it is known that the motor power $P = 13.69 \text{ kW}$, $n = 136.4 \text{ r/min}$, and that the diameter of the motor shaft and the diameter of the gearbox input shaft are both 42 mm. Choose one type of coupling (fixed rigid coupling, removable rigid coupling, flexible sleeve-column coupling, flexible pin coupling, tire-type coupling) giving the appropriate justification and calculating the torque.

Working condition factor: $K_A = 1.5$



ME311: 机械设计

2023年秋季

Deadline of this homework: Dec 05 @ **23:30**

Link to submission:

https://ancorasir.com/?page_id=3987

All homework MUST be hand-written.

No late submission is allowed!

Please refer to the above link for further details on how to make the submission and the detailed deadline for submission.

谢谢~

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